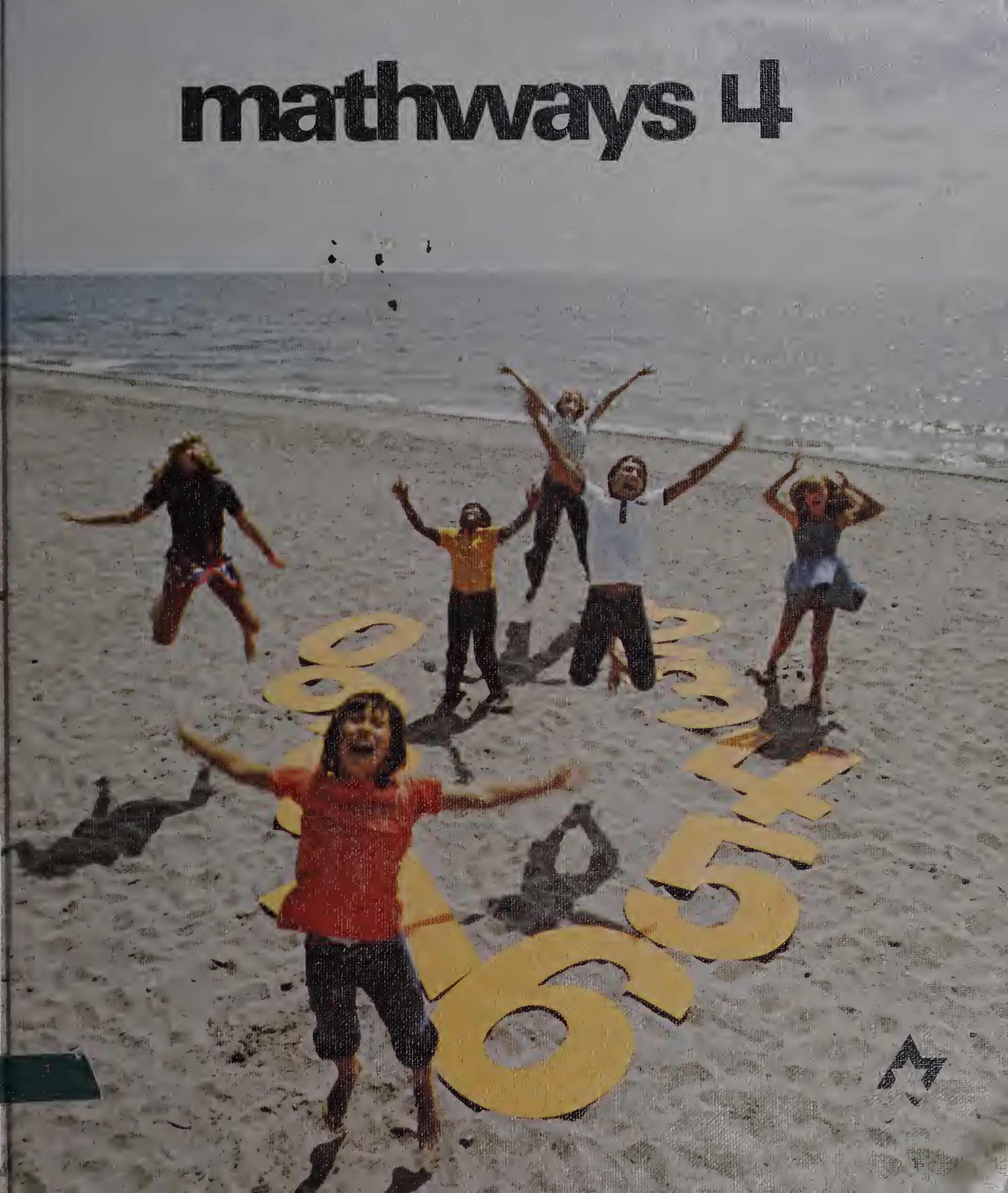
mathways 4



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QUAECUMQUE VERA

mathways 4

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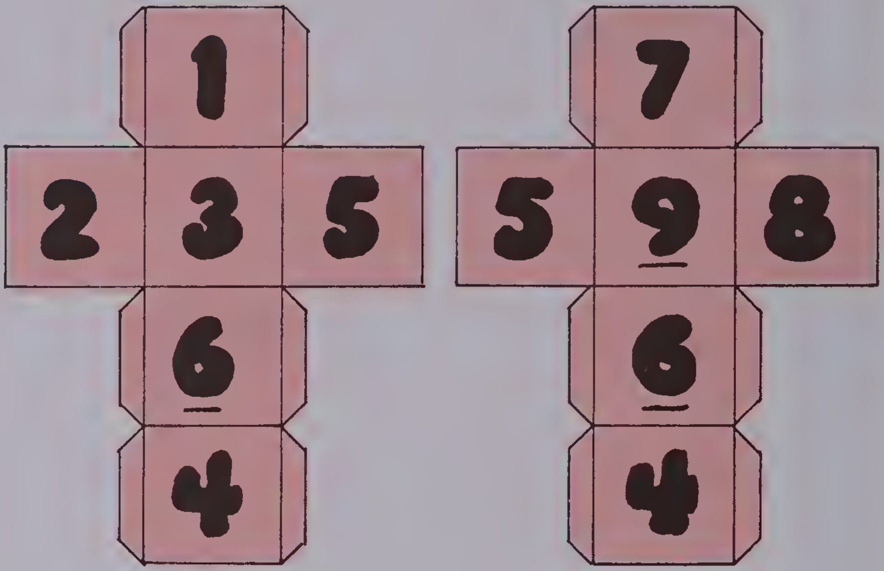
1

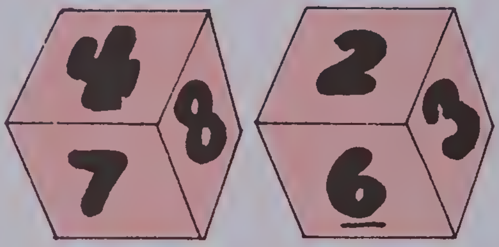
EXPLORE

0, 1, 2, 3, 4, 5, 6, 7, 8, 9 The Meaning Depends on the Place

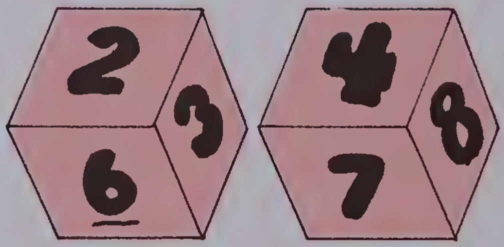
Sally and Martin were playing a number game.
They used dice marked like the patterns
at the right.


1
2
3
5
6
4
7
5
9
8
6
4

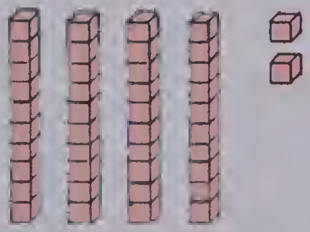
Sally rolled a 4 and a 2.
"Look," said Sally,
"I can show 42.



I can also show 24."



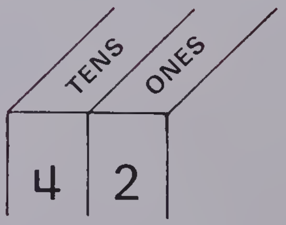
Here are some different ways of showing 42.



10 + 10 + 10 + 10 + 2

20 + 10 + 10 + 2

20 + 20 + 2

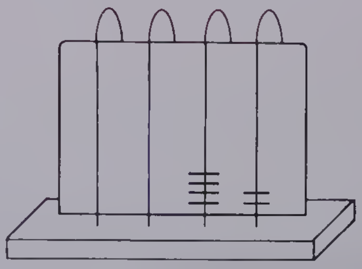

TENS
ONES
4
2

40 + 2

30 + 12

4 tens and 2

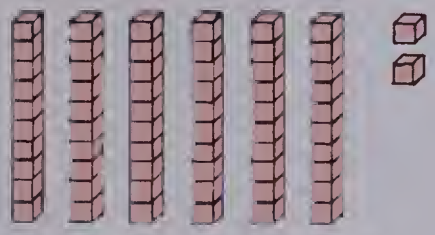
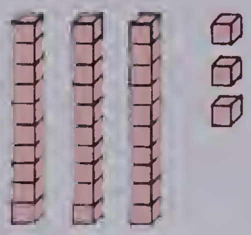
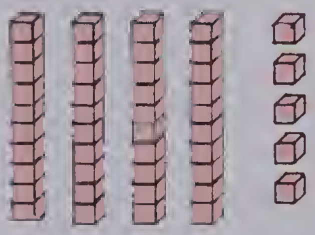
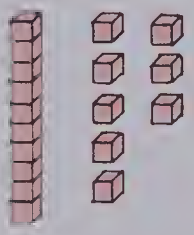
4 dimes and 2 pennies



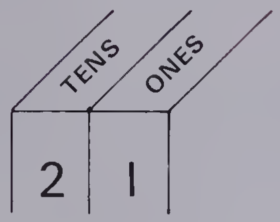
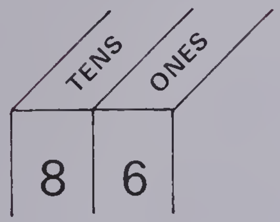
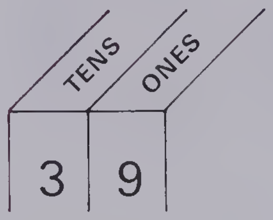
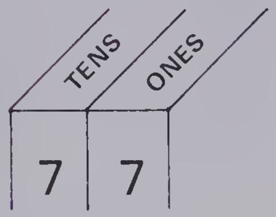
Use the same ways to show 24.

IN ACTION

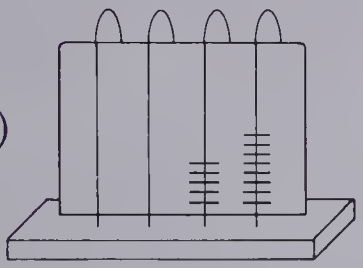
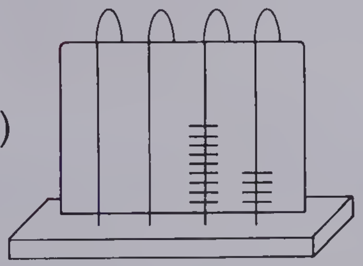
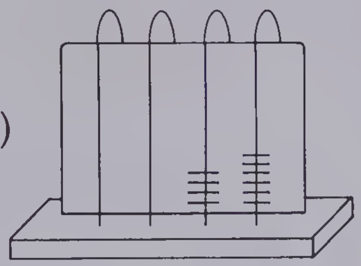
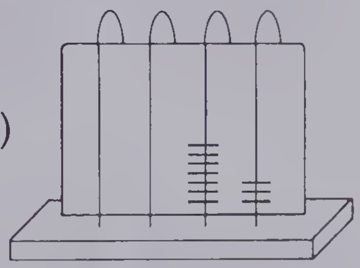
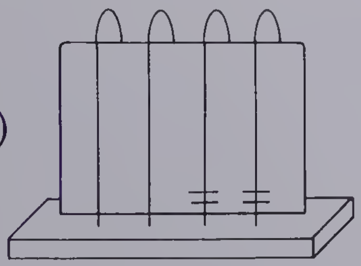
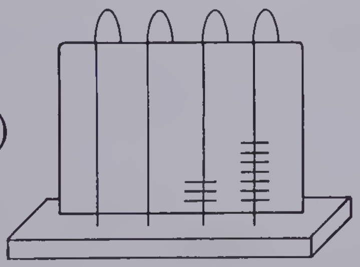
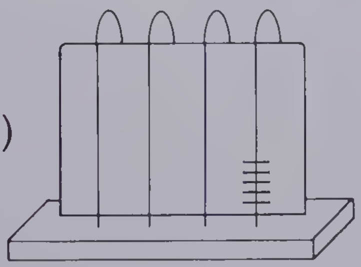
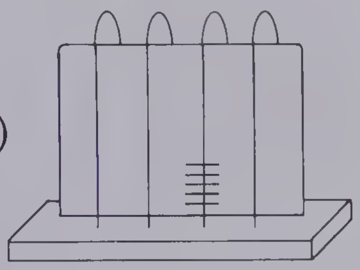
What numbers are represented?

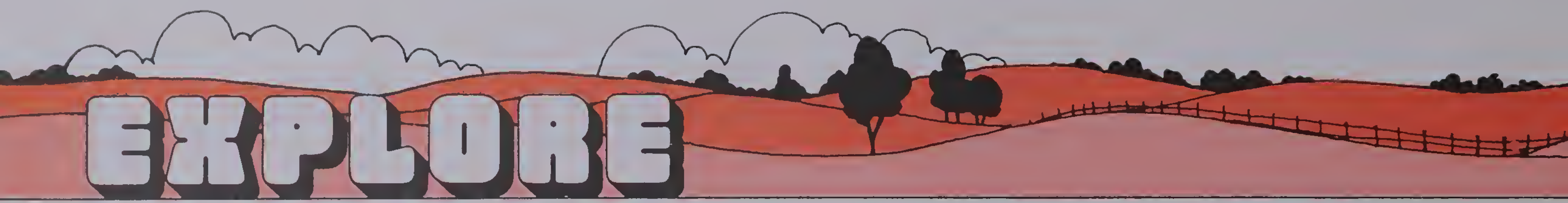
1. a) 
b) 
c) 
d) 

2. a) 10 + 10 + 5 b) 10 + 10 + 9 c) 10 + 1 d) 10 + 10
e) 60 + 10 + 4 f) 40 + 10 + 7 g) 60 + 3 h) 40 + 5
i) 20 + 4 j) 70 + 0 k) 80 + 2 l) 20 + 12
m) 40 + 15 n) 80 + 13 o) 50 + 16 p) 30 + 11
q) 1 ten and 8 r) 9 tens and 7 s) 5 tens and 4 t) 3 tens and 1

3. a) 
TENS
ONES
2
1
b) 
TENS
ONES
8
6
c) 
TENS
ONES
3
9
d) 
TENS
ONES
7
7

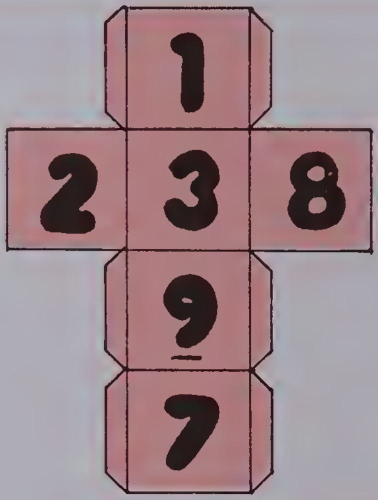
4. a) 5 dimes and 8 pennies b) 6 dimes and 4 pennies c) 8 dimes and 0 pennies
d) 0 dimes and 3 pennies e) 4 dimes and 4 pennies f) 7 dimes and 1 penny

5. a) 
b) 
c) 
d) 
e) 
f) 
g) 
h) 



EXPLORE

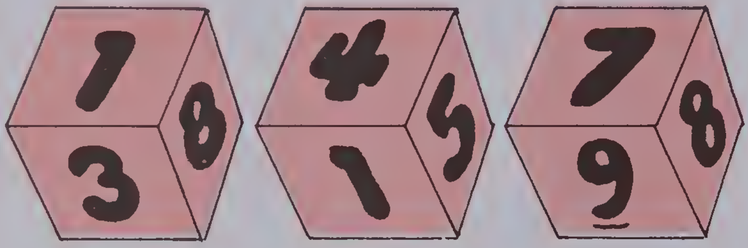
Hundreds, Tens, and Ones



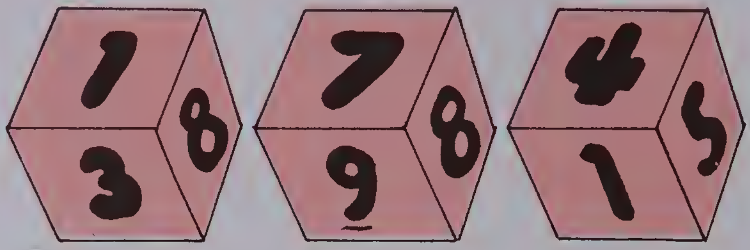
For their next game, Martin and Sally added
1 more die to the 2 they already had.

Martin rolled the 3 dice and got
a 1, a 4, and a 7.

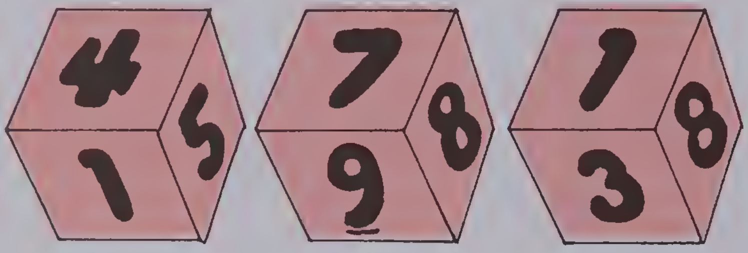
He said, "I can show 6 different numbers!"



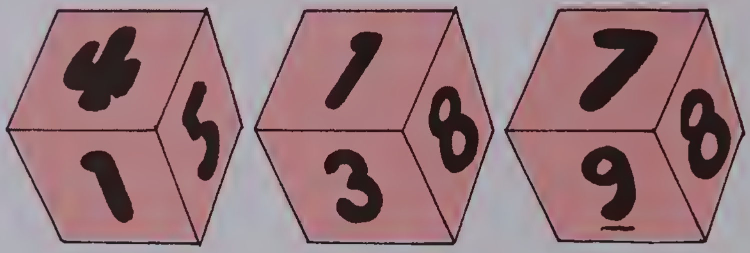
147



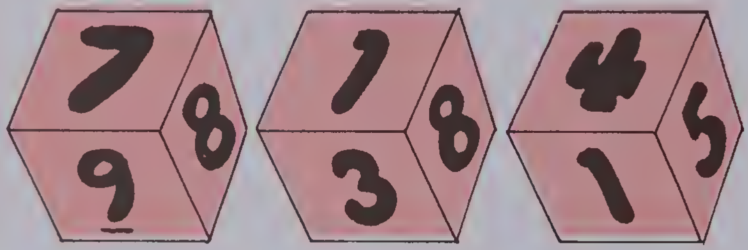
174



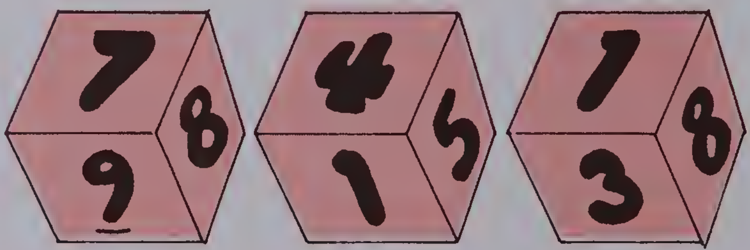
471



417

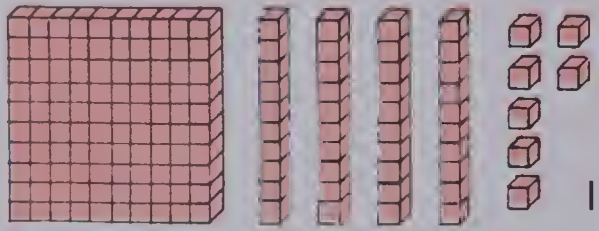


714



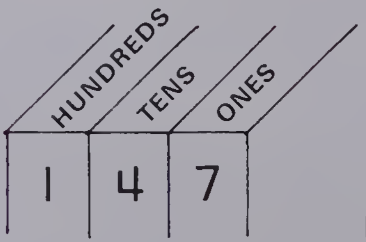
741

Here are some different ways of showing 147.

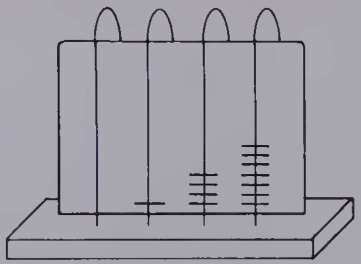


100 + 40 + 7

1 hundred, 4 tens, and 7



HUNDREDS	TENS	ONES
1	4	7

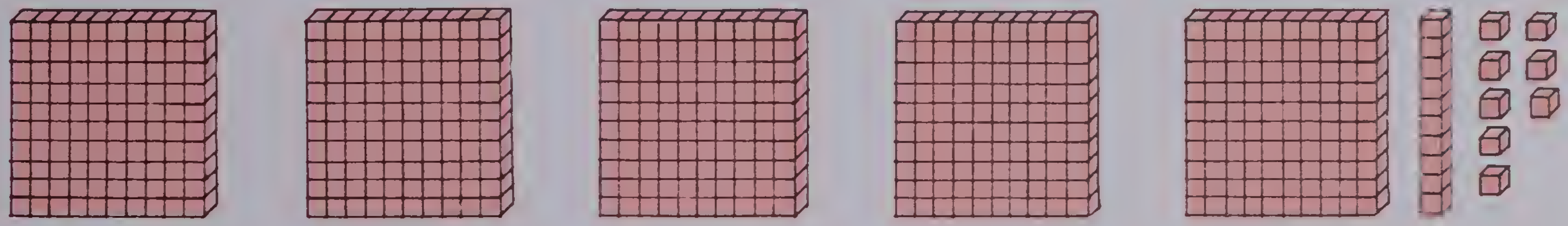


Use the same ways to show 2 of these numbers: 174, 471, 417, 714, 741.

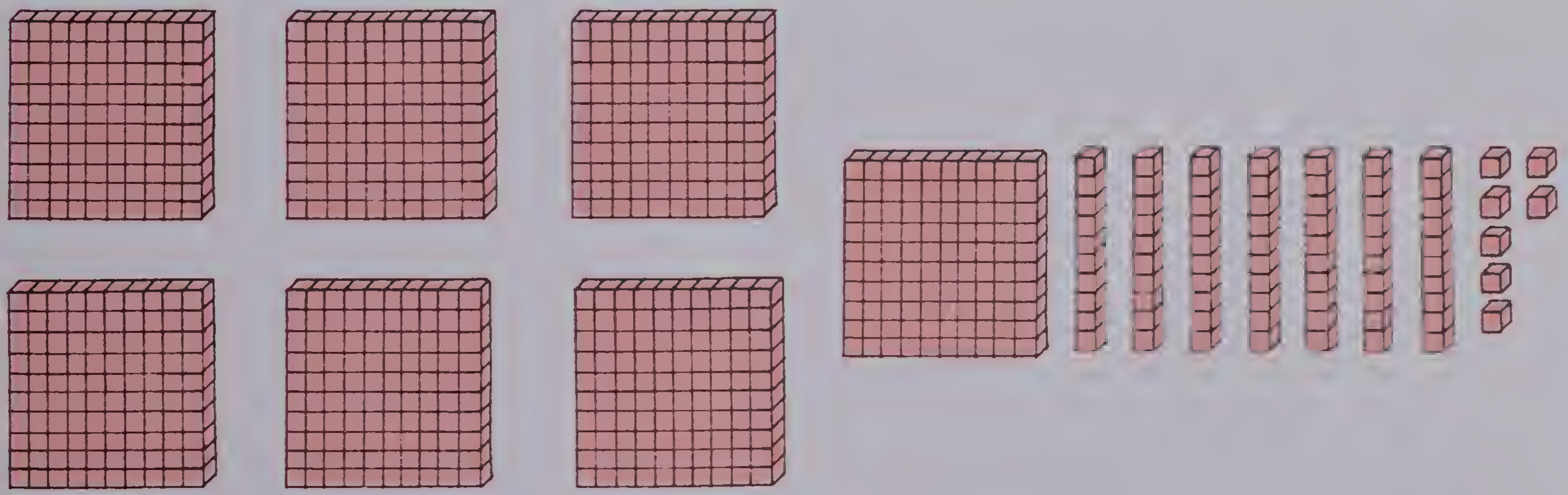
IN ACTION

What numbers are represented?

1. a)



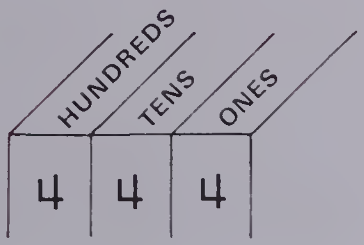
b)



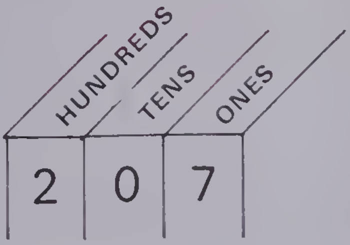
c) 300 + 20 + 9　　d) 100 + 30 + 2　　e) 400 + 50 + 4　　f) 900 + 40 + 1

2. a) 6 hundreds, 8 tens, and 5　　b) 8 hundreds, 9 tens, and 6
   c) 2 hundreds, 0 tens, and 3　　d) 5 hundreds, 1 ten, and 0

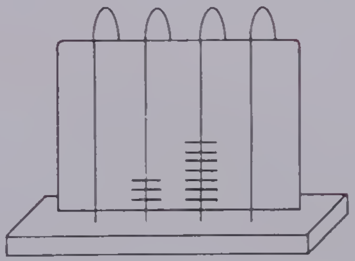
e)


HUNDREDS
TENS
ONES
4
4
4

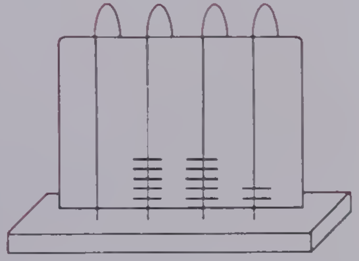
f)


HUNDREDS
TENS
ONES
2
0
7

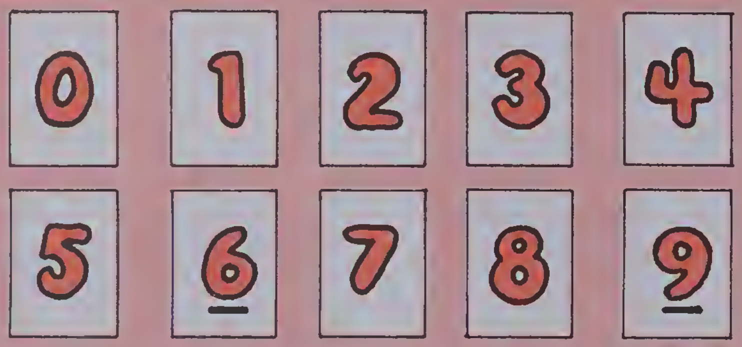
g)



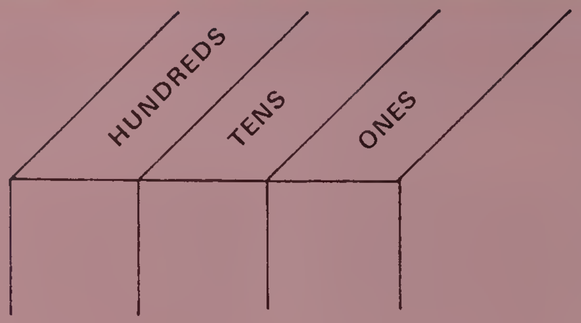
h)



Greatest Number (3 to 6 players)

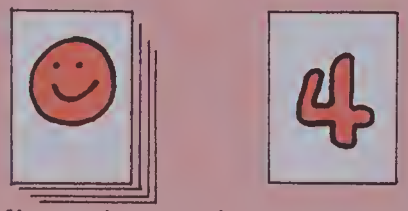

0
1
2
3
4
5
6
7
8
9

A Make a deck of cards like this.

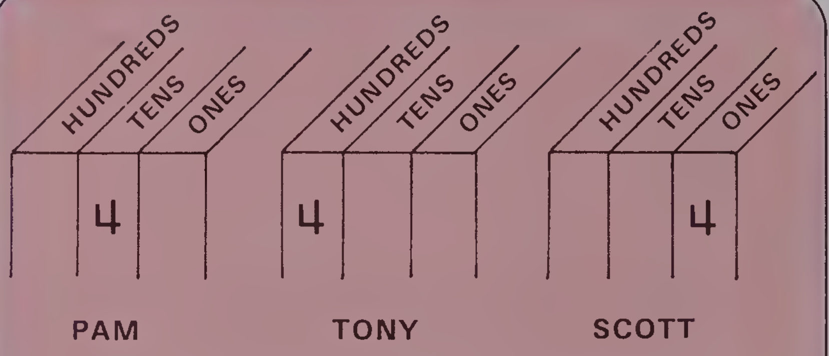

HUNDREDS
TENS
ONES

B Each player makes a place value chart like this.

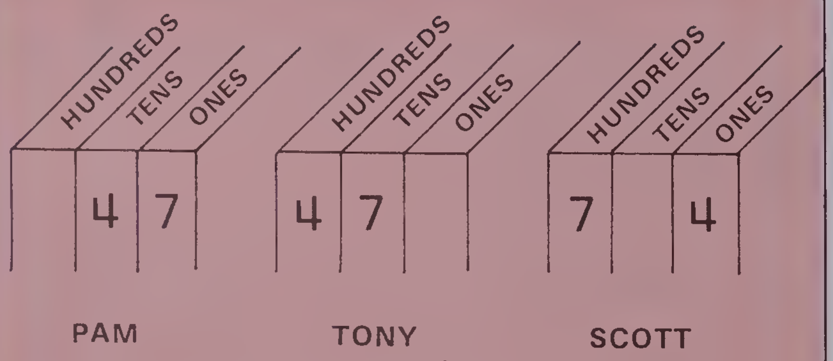
C Shuffle the cards and place the deck face down.



The first player draws a card and places it face up beside the deck. The players write the numeral in their charts.


HUNDREDS
TENS
ONES
4
PAM
HUNDREDS
TENS
ONES
4
TONY
HUNDREDS
TENS
ONES
4
SCOTT

D In this round, 3 different players wrote the 4 in these places.


HUNDREDS
TENS
ONES
4
7
PAM
HUNDREDS
TENS
ONES
4
7
TONY
HUNDREDS
TENS
ONES
7
4
SCOTT

E The second card was a 7.

F The third card was a 1.

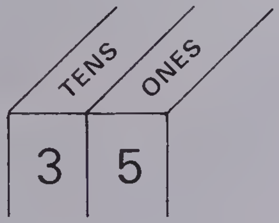
What were the 3 numbers?

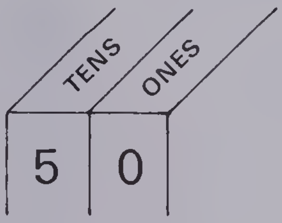
Who had the **Greatest Number**?

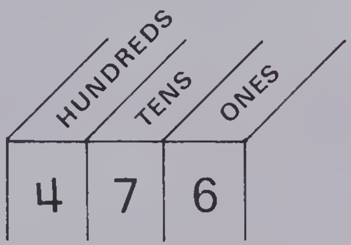
Play this game yourself.

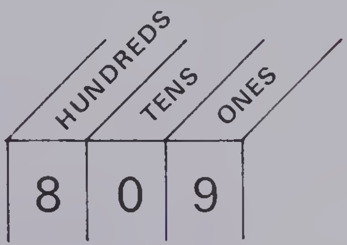
Retrace Your Steps

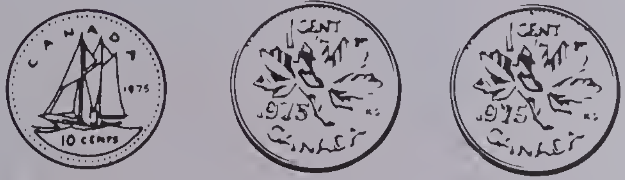
1. What numbers are represented?

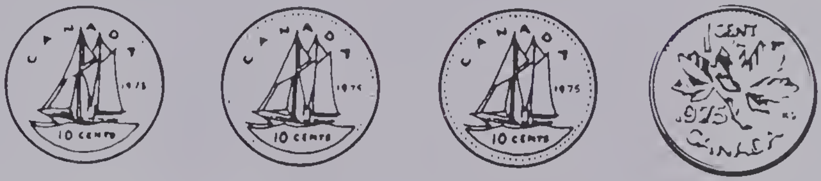
a) 

b) 

c) 

d) 

e) 

f) 

g) 2 tens and 7
h) 4 tens and 8
i) 7 hundreds, 6 tens, and 4
j) 3 hundreds, 9 tens, and 0
k) 8 tens and 3
l) 5 hundreds, 2 tens, and 9
m) 10 + 7
n) 60 + 2
o) 40 + 1
p) 200 + 50 + 8
q) 600 + 70 + 3
r) 100 + 0 + 5
s) 80 + 4
t) 900 + 90 + 6
u) 50 + 10 + 10 + 2
v) 20 + 10 + 8
w) 10 + 20 + 10 + 6
x) 100 + 100 + 100 + 50 + 10 + 1
y) 200 + 200 + 100 + 20 + 7
z) 500 + 100 + 100 + 10 + 5

2. Order from least to greatest.

a) 53 17 96 84 35 99
71 69 48 66 10 50

b) 123 456 231 654 645 213
312 465 132 546 321 564

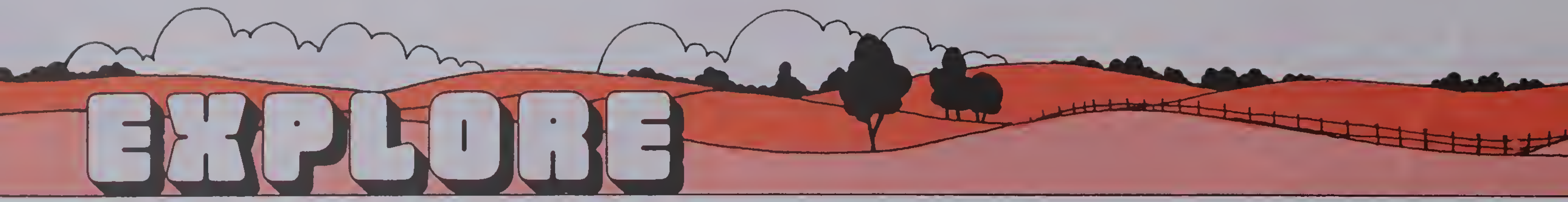
3. Order from greatest to least.

a) 70 28 38 47 97 80
53 24 82 94 79 89

b) 801 973 782 939 600 159
295 408 867 742 826 915

4. Continue the patterns for 6 more numbers.

a) 74, 75, 77, 78, 80, . . .
b) 83, 82, 79, 78, 75, . . .
c) 91, 94, 92, 95, 93, . . .
d) 650, 653, 655, 658, 660, . . .
e) 427, 425, 424, 422, 421, . . .
f) 578, 575, 576, 573, 574, . . .



EXPLORE

Number Pairs/Addition, Subtraction

(12,5) is a **number pair.**

Addition

Think 17

Subtraction

Think 7

The first number of the pair
is always used first.

IN ACTION

1. Think addition. Match the number pairs with the answers.
Record this way.
(7,5) ⟶ 12

(9,4) (3,5) (3,8) (9,9)
(6,7) (4,4) (9,6) (7,7)
(7,8) (6,2) (4,7) (5,5)
Number pairs

14 11 15
18 13
8 10
Answers

2. Think subtraction. Match the number pairs with the answers.
Record this way.
(7,5) ⟶ 2

(15,7) (12,6) (9,5) (16,8)
(13,4) (11,4) (17,9) (14,7)
(7,7) (18,9) (16,7) (10,5)
Number pairs

4 9 5
8 0
7 6
Answers

3. Look at the number pair and the operation.
Think the answer and write it.

a)

Subtract	
Number pair	Answer
(15,9)	
(9,4)	
(4,4)	
(12,3)	
(16,13)	
(14,6)	
(11,5)	
(18,15)	
(12,2)	
(13,5)	
(10,1)	
(17,14)	
(14,3)	

b)

Add	
Number pair	Answer
(6,4)	
(10,2)	
(3,9)	
(8,8)	
(11,5)	
(5,9)	
(6,6)	
(3,4)	
(8,9)	
(2,9)	
(4,6)	
(12,2)	
(6,9)	

c) Are there any facts in the charts that you found difficult?
If there are, make a list and review them.

4. Copy and complete to make the answer 8.
a) (2,?) add
b) (19,?) subtract
c) (?,?) subtract
d) (?,?) ?

5. Give 3 number pairs and an operation with each pair to make the answer given.
a) 12 b) 9 c) 10 d) 1 e) 0 f) 20

6. You may wish to work with a partner to check number facts.
Write a number pair and give the operation, addition or subtraction.
Your partner gives the answer. Take turns writing number pairs.

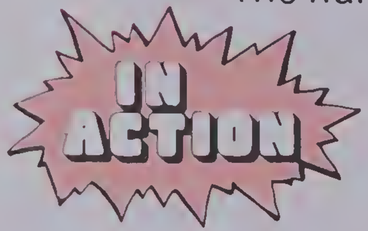
Letters for Numbers

$n = 12 + 4$
A number equals 12 add 4.
$n = 16$
The number is 16.

$k + 6 = 14$
A number add 6 equals 14.
$k = 8$
The number is 8.

$20 - p = 8$
20 subtract a number equals 8.
$p = 12$
The number is 12.

$w - 3 = 8$
A number subtract 3 equals 8.
$w = 11$
The number is 11.

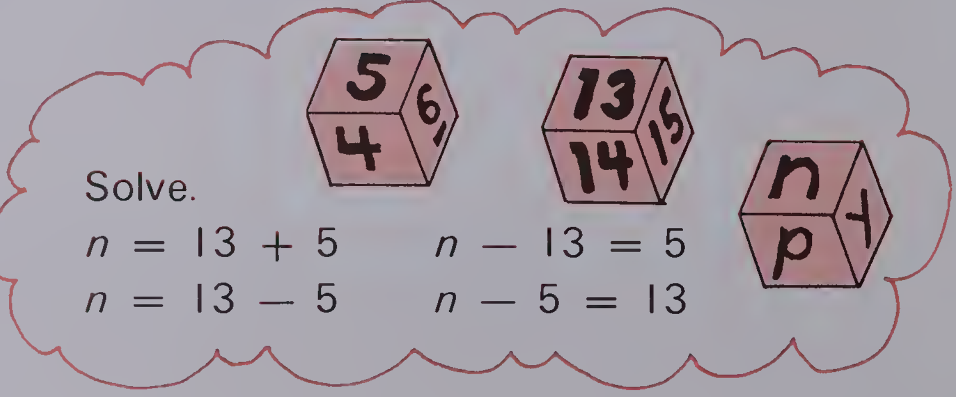


1. Solve.
   a) $k = 0 + 13$ b) $c = 9 + 8$ c) $p = 5 + 6$ d) $y = 13 + 1$
   e) $g = 8 + 5$ f) $m = 6 + 8$ g) $k = 15 + 2$ h) $d = 11 + 4$

2. Solve.
   a) $e = 17 - 8$ b) $y = 18 - 13$ c) $g = 15 - 6$ d) $p = 14 - 8$
   e) $m = 12 - 5$ f) $n = 7 - 6$ g) $h = 16 - 14$ h) $c = 20 - 5$

3. Solve.
   a) $p + 4 = 11$ b) $g + 12 = 17$ c) $d + 2 = 13$ d) $m + 7 = 15$
   e) $14 - k = 5$ f) $17 - p = 14$ g) $13 - n = 7$ h) $16 - y = 5$
   i) $d - 8 = 2$ j) $f - 9 = 0$ k) $m - 4 = 8$ l) $n - 3 = 6$

4. Use 3 wooden cubes to make dice.
   Mark one die 10, 11, 12, 13, 14, 15.
   Mark another die p, n, k, y, d, f.
   Mark the third die 4, 5, $\underline{6}$, 7, 8, $\underline{9}$.
   Roll the dice.
   Write sentences and solve them.



Solve.
$n = 13 + 5$ $n - 13 = 5$
$n = 13 - 5$ $n - 5 = 13$

5. Solve.

a) $p = 3 + 5 + 7$ b) $k = 4 + 3 + 9$ c) $m = 9 + 7 - 8$ d) $n = 5 - 4 + 7$

Think
8, 15

e) $w = 6 + 7 - 5$ f) $y = 7 + 8 - 6$ g) $v = 6 + 5 - 4$

6. What is the number? Write a sentence and solve.

a) A number equals 6 add 7.
$n = 6 + 7$
$n = ?$

b) A number add 7 equals 12.

c) A number add 3 equals 11.

d) A number add 9 equals 17.

e) 17 subtract a number equals 8.

f) A number subtract 8 equals 8.

g) 12 subtract a number equals 9.

h) A number subtract 5 equals 9.

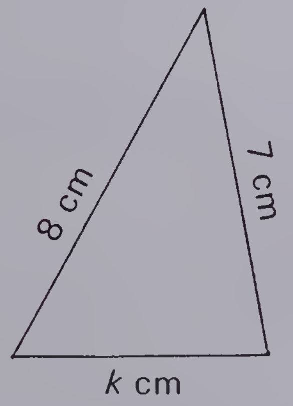
7. Solve.

a) $n = 5 + 5 + 5$ b) $p = 6 - 5 + 9$ c) $k = 7 + 6 - 5$
d) $a = 4 + 9 - 6$ e) $w = 3 + 7 - 4$ f) $v = 15 - 7 + 8$
g) $f = 16 - 9 + 4$ h) $y = 15 - 9 + 6$ i) $m = 14 - 6 + 5$
j) $n = 11 - 5 + 9$ k) $p = 12 - 9 + 8$ l) $c = 8 + 7 - 10$

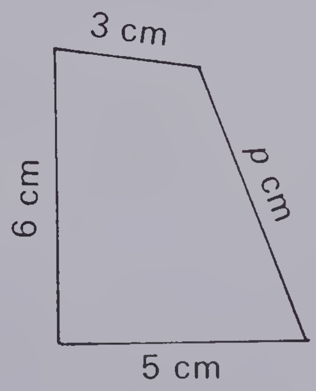
8. What number does each letter represent?

The distance around each figure is 20 cm.

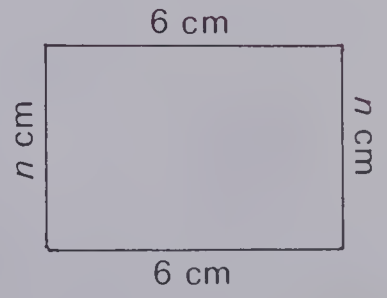
a)

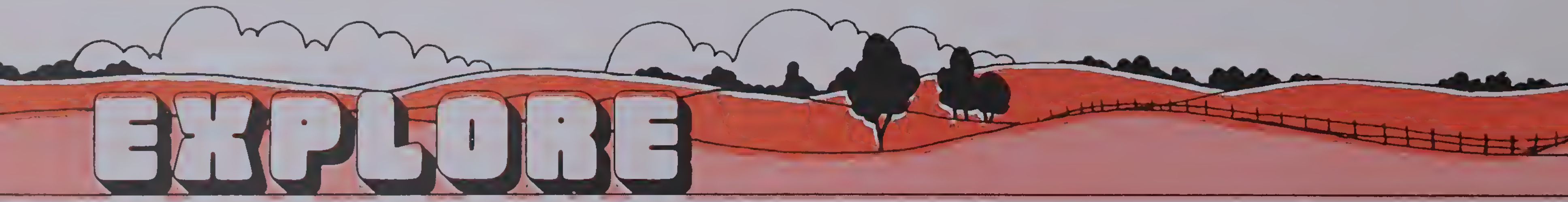


b)



c)





EXPLORE

Skill Chart

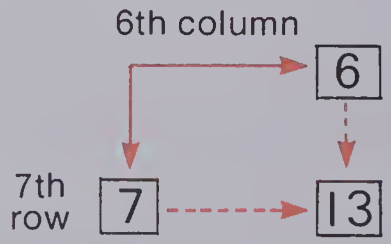
Improve your skill.

10 columns

10 rows

+	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	11
2	3	4	5	6	7	8	9	10	11	12
3	4	5	6	7	8	9	10	11	12	13
4	5	6	7	8	9	10	11	12	13	14
5	6	7	8	9	10	11	12	13	14	15
6	7	8	9	10	11	12	13	14	15	16
7	8	9	10	11	12	13	14	15	16	17
8	9	10	11	12	13	14	15	16	17	18
9	10	11	12	13	14	15	16	17	18	19
10	11	12	13	14	15	16	17	18	19	20

Use the chart to check addition and subtraction facts.



Number pair (7,6)
(7,6) add→13
(13,6) subtract→7
(13,7) subtract→6

a) Look for patterns in the chart.

6	7
7	8

Add.

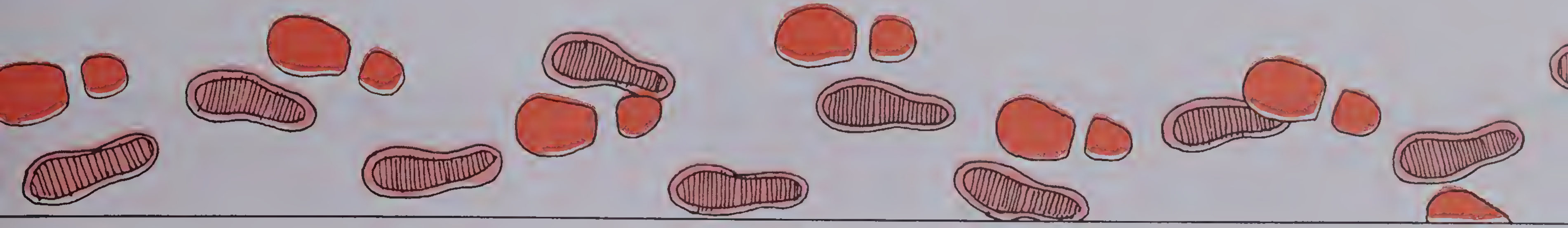
$$\begin{array}{r} 6 \\ 8 \\ \hline 14 \end{array} \qquad \begin{array}{r} 7 \\ 7 \\ \hline 14 \end{array}$$

Does this work for all 2 by 2 sections?

b) Try the addition pattern for 3 by 3 sections.

7	8	9
8	9	10
9	10	11

c) Find other patterns.



Retrace Your Steps

1. Record the answers in a column.

a)

Number pair	Sum
(4,5)	
(7,6)	
(2,8)	
(8,6)	
(4,7)	
(9,3)	
(5,10)	
(8,11)	

b)

Number pair	Difference
(16,5)	
(11,3)	
(18,9)	
(15,7)	
(19,13)	
(12,8)	
(20,6)	
(14,9)	

2. Write 4 number pairs for each sum.

a) 18 b) 14 c) 16 d) 20
e) 17 f) 13 g) 15 h) 19

3. Write 4 number pairs for each difference.

a) 10 b) 12 c) 7 d) 9
e) 13 f) 8 g) 11 h) 14

4. Add.

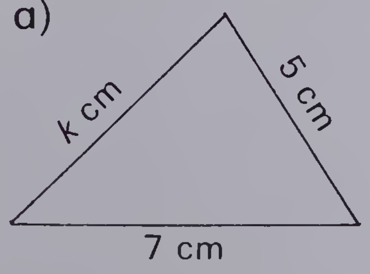
6	8	3	4	6	6	3	7	5	2
5	4	7	9	4	8	2	3	3	2
7	5	5	3	9	6	6	3	6	8

5. Solve.

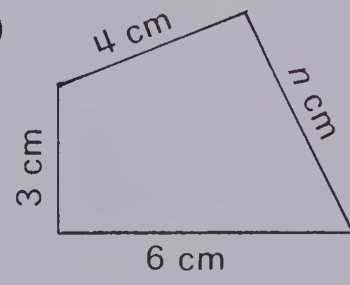
a) $y = 4 + 16$ b) $19 - w = 7$ c) $v + 11 = 18$ d) $r - 6 = 11$ e) $p = 16 - 9$
f) $n + 0 = 17$ g) $m - 8 = 8$ h) $6 + k = 15$ i) $j = 14 + 5$ j) $20 - f = 7$

6. The distance around each figure is 18 cm. Solve.

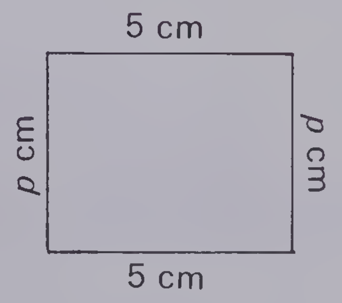
a)



b)



c)



EXPLORE

Patterns in Addition and Subtraction

These patterns are easy if you know the facts to 20.
Complete each pattern.

7 + 9 = 16, 17 + 9 = 26, 27 + 9 = ?, to 87 + 9 = 96
15 − 8 = 7, 25 − 8 = 17, 35 − 8 = ?, to 95 − 8 = ?

IN ACTION

1. Complete each pattern.
   a) 4 + 8 = 12 to 84 + 8 = 92
   b) 10 − 6 = 4 to 90 − 6 = 84
   c) 7 + 3 = 10 to 97 + 3 = 100
   d) 12 − 9 = 3 to 92 − 9 = 83
   e) 10 − 10 = 0, 20 − 10 = 10, 30 − 10 = ?, to 100 − 10 = ?

2. Make up 4 different patterns like those in Question 1.

3. Add. $\begin{array}{r} 7\uparrow \\ \underline{9\,|} \end{array}$ Think 16

$$\begin{array}{cccccc} 1 & 8 & 9 & 8 & 5 & 2 \\ \underline{9} & \underline{5} & \underline{4} & \underline{2} & \underline{9} & \underline{9} \end{array}$$

$$\begin{array}{cccccc} 3 & 7 & 2 & 9 & 7 & 5 \\ \underline{8} & \underline{5} & \underline{8} & \underline{1} & \underline{3} & \underline{6} \end{array}$$

Add. $\begin{array}{r} 5\uparrow \\ 3\,| \\ \underline{9\uparrow} \end{array}$ Think 12, 17

$$\begin{array}{ccccc} 4 & 10 & 7 & 2 & 9 \\ 6 & 9 & 3 & 9 & 3 \\ \underline{8} & \underline{0} & \underline{5} & \underline{5} & \underline{8} \end{array}$$

4. Subtract. $\begin{array}{r} 14\,| \\ \underline{5\downarrow} \end{array}$ Think 9

$$\begin{array}{cccccccccccc} 11 & 10 & 11 & 10 & 11 & 12 & 11 & 15 & 10 & 10 & 14 & 10 \\ \underline{8} & \underline{9} & \underline{5} & \underline{3} & \underline{7} & \underline{5} & \underline{2} & \underline{6} & \underline{4} & \underline{7} & \underline{5} & \underline{2} \end{array}$$

5. Add. Think the answer and record.

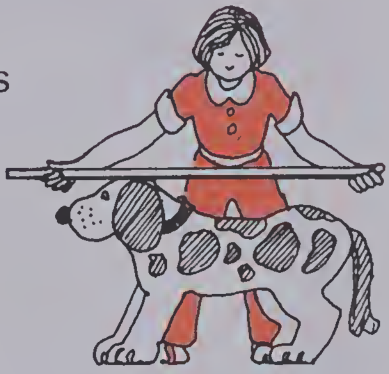
a)	8	18	b)	9	29	c)	3	43	d)	5	65	e)	3	33
	6	6		4	4		7	7		9	9		8	8
f)	4	24	g)	5	75	h)	8	58	i)	7	87	j)	8	78
	7	7		5	5		8	8		7	7		9	9

6. Subtract. Think the answer and record.

a)	13	33	b)	13	63	c)	15	25	d)	17	77	e)	10	40
	9	9		7	7		8	8		9	9		2	2
f)	12	82	g)	14	64	h)	11	91	i)	16	86	j)	11	91
	4	4		8	8		4	4		7	7		9	9

7. There are 17 bicycle riders in one group and 9 riders in another group. How many riders are in the 2 groups?

8. Rita guessed that her dog was 85 cm long. Her guess was 7 cm too long. How long was Rita's dog?



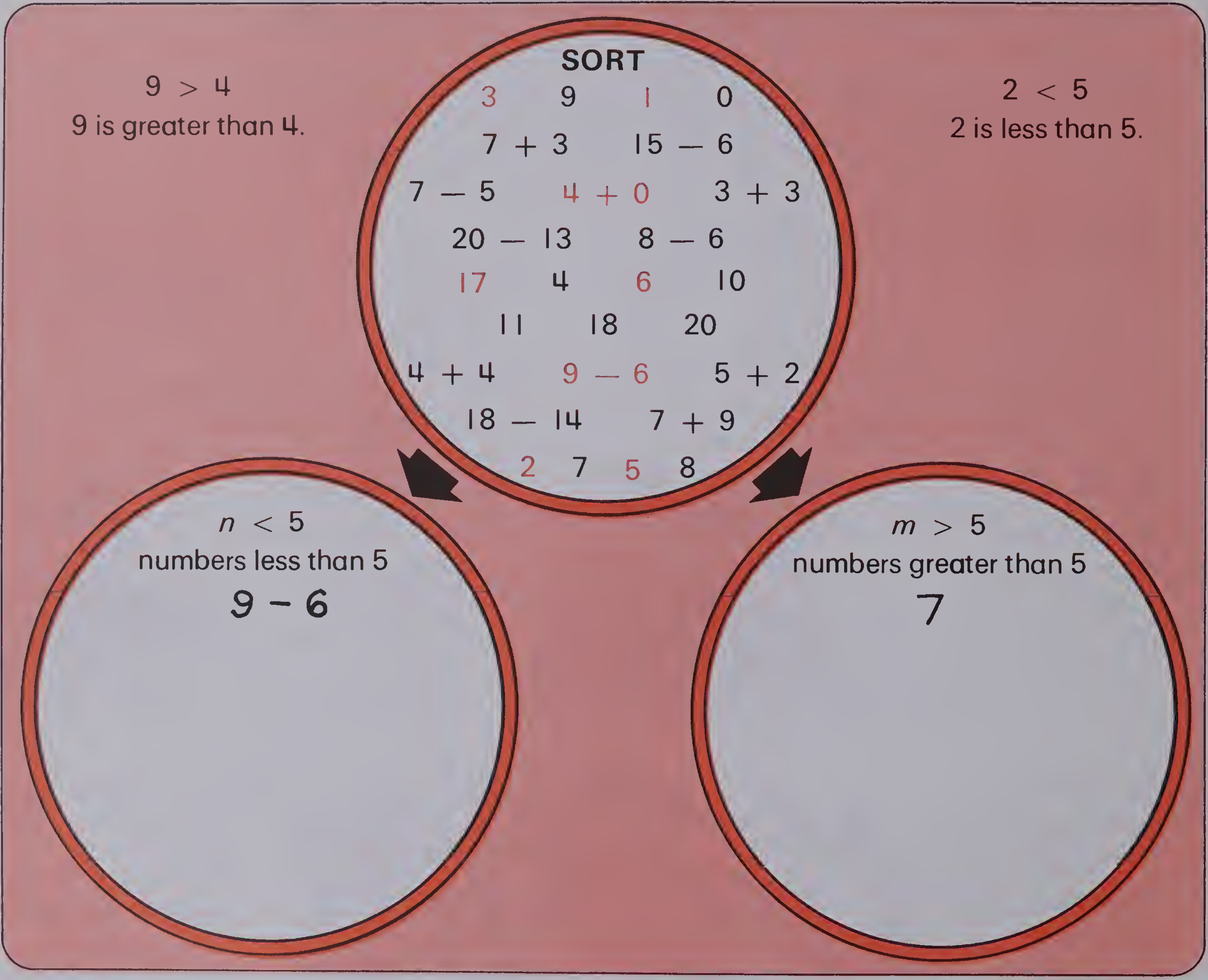
9. 23 children are playing dodgeball. 8 of them are boys. How many girls are there?

10. There are 33 pupils in Grade 4. 7 were away on Wednesday. How many were present?

11. Robert planted 19 tulip bulbs on Saturday and 8 on Sunday. How many bulbs did he plant on the weekend?

EXPLORE

> Is Greater Than < Is Less Than



9 > 4
9 is greater than 4.

2 < 5
2 is less than 5.

SORT

3 9 1 0
7 + 3 15 − 6
7 − 5 4 + 0 3 + 3
20 − 13 8 − 6
17 4 6 10
11 18 20
4 + 4 9 − 6 5 + 2
18 − 14 7 + 9
2 7 5 8

$n < 5$
numbers less than 5
9 − 6

$m > 5$
numbers greater than 5
7

IN ACTION

1. Copy, using the correct symbol, > or <.

a) 3 ? 0
b) 8 ? 7
c) 16 ? 12
d) 4 + 3 ? 8
e) 15 − 10 ? 4
f) 9 ? 2 + 8
g) 15 ? 17
h) 12 + 6 ? 17
i) 3 + 10 ? 1 + 13
j) 22 ? 33
k) 18 ? 9 + 10
l) 23 − 8 ? 16

2. Copy, using the correct symbol, $>$ or $<$ or $=$.

   a) 20 + 7 ? 8 + 9 + 5 b) 70 + 3 ? 64 + 8 + 1 c) 47 − 9 ? 35 + 5 − 2

3. Copy, using the correct symbol, $>$ or $<$ or $=$.

   a) 5 tens and 3 ? 4 tens and 9 b) 7 tens and 8 ? 6 tens and 18
   c) 6 tens and 11 ? 7 tens and 4 d) 8 tens and 0 ? 7 tens and 9
   e) 126 ? 100 + 20 + 6 f) 150 ? 100 + 40 + 9 g) 169 ? 100 + 50 + 9

4. Sort.
   a) $n > 20$ b) $p < 20$
   c) $k = 20$

32 − 9 14 + 5
6 + 9 + 4 8 + 9
6 + 7 + 7 4 + 9 + 8
12 − 6 + 14 14 + 7
30 − 10 12 + 9 28 − 9
19 + 8 − 6 7 + 4 + 9
23 − 5 + 2
34 − 6 − 7

5. Sort.
   a) $p < 10$ b) $k > 19$
   c) c : numbers that tell the values of coins

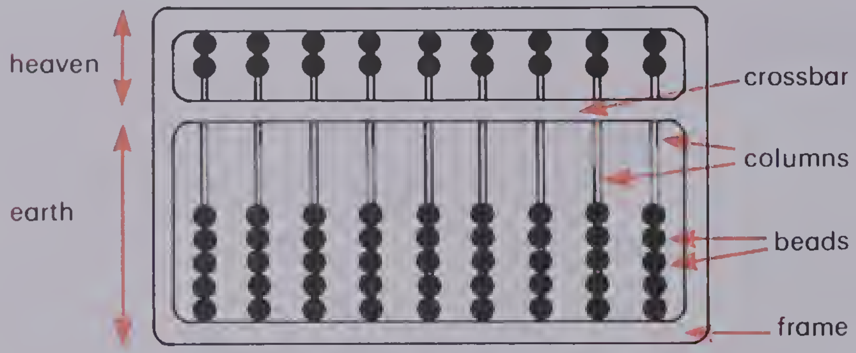
0 1 2
4 7 8 9 10
19 25 27 50
75 100
11

6. Make as many numbers as you can, using the digits 0, 1, 2. You may have 1-digit, 2-digit, or 3-digit numbers. Sort your numbers into 3 sets :
   a) $n > 10$ b) $p = 10$ c) $k < 10$

7. Make as many numbers as you can, using the digits 3, 4, 5. You may have 1-digit, 2-digit, or 3-digit numbers. Sort your numbers into 3 sets :
   a) $s < 54$ b) $e = 54$ c) $g > 54$

8. Make up a sorting problem.

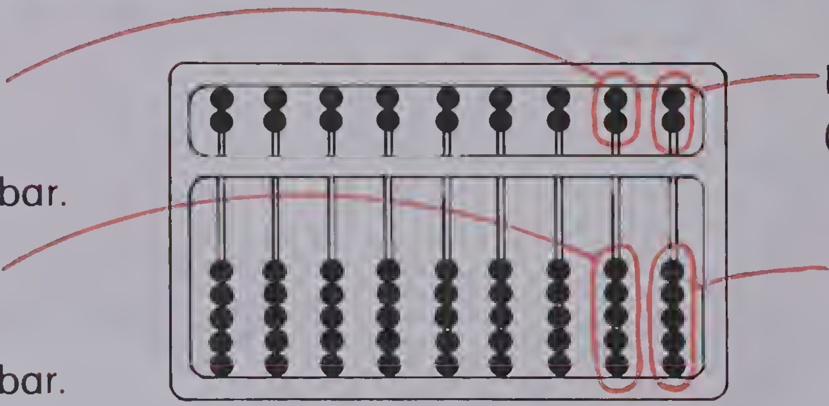
The Abacus – A Very Ancient Calculator



This is another type of abacus.

When the beads are against the outside frame, the abacus is "clear".

When some beads are brought up or down to the crossbar, they represent numbers.



Each of these beads represents 50 when brought to the crossbar.

Each of these beads represents 10 when brought to the crossbar.

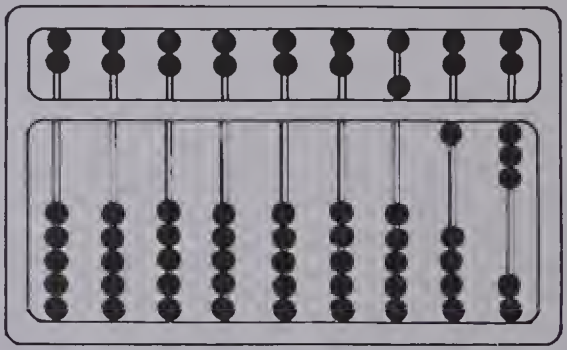
Each of these beads (heaven beads) represents 5 when brought to the crossbar.

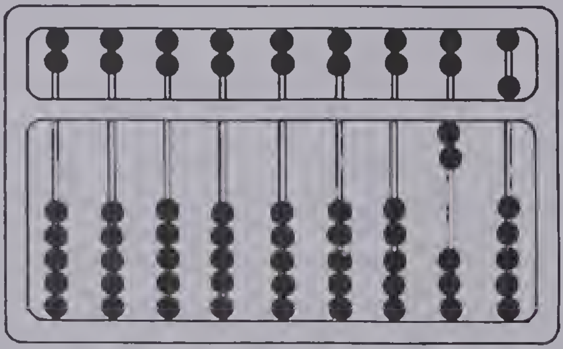
Each of these beads (earth beads) represents 1 when brought to the crossbar.

What number is represented by an earth bead and a heaven bead moved to the crossbar on the third wire?

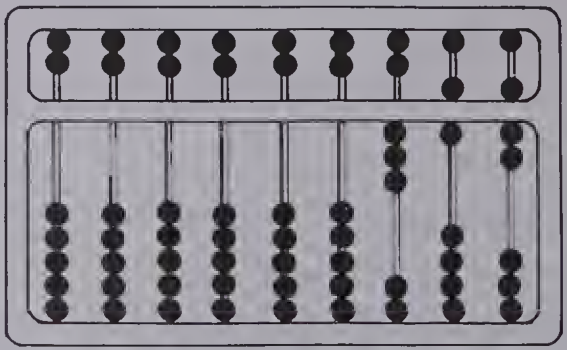
2 heaven beads in the first column are replaced by just 1 earth bead in the second.

This is how to represent 513.





What number is represented here?



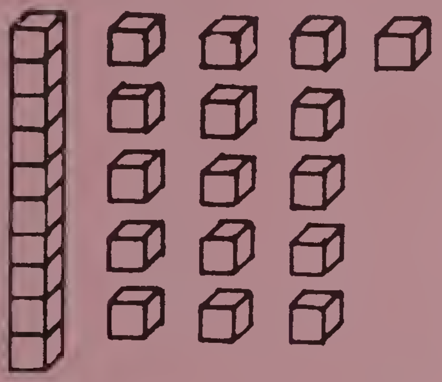
What number is represented here?

Read about the abacus in an encyclopedia.

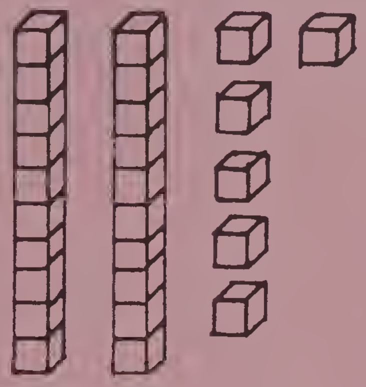
EXPLORE

Regrouping / Tens and Ones

Exchanging 10 for 1.



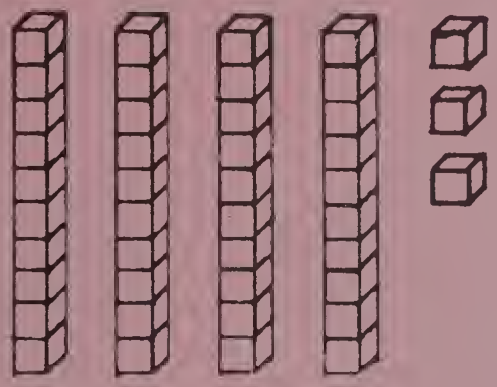
OR



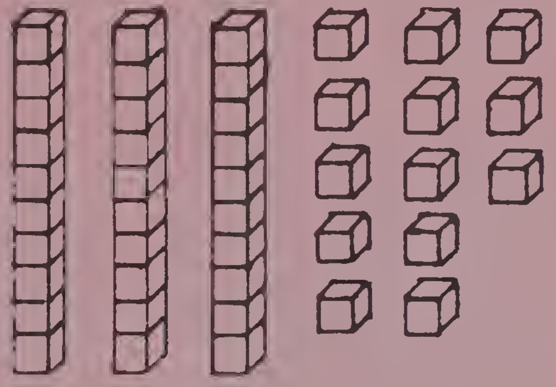
OR 26

Exchanging 1 for 10.

43 OR



OR



50 + 19 OR 60 + ? OR 69

77 OR 70 + ? OR 60 + 17

IN ACTION

Regroup. Exchange 10 for 1 or 1 for 10.

a) 20 + 18 = 30 + 8 = ?

b) 82 = ? + 2 = ? + 12

c) 40 + 13 = ? + 3 = 53

d) 77 = ? + ? = 60 + ?

e) 60 + 15 = ? + ? = 75

f) 91 = ? + 1 = ? + 11

g) ? + 12 = 60 + 2 = ?

h) ? = ? + 4 = 20 + 14

i) 0 + ? = 10 + 7 = ?

j) 12 = ? + ? = ? + ?

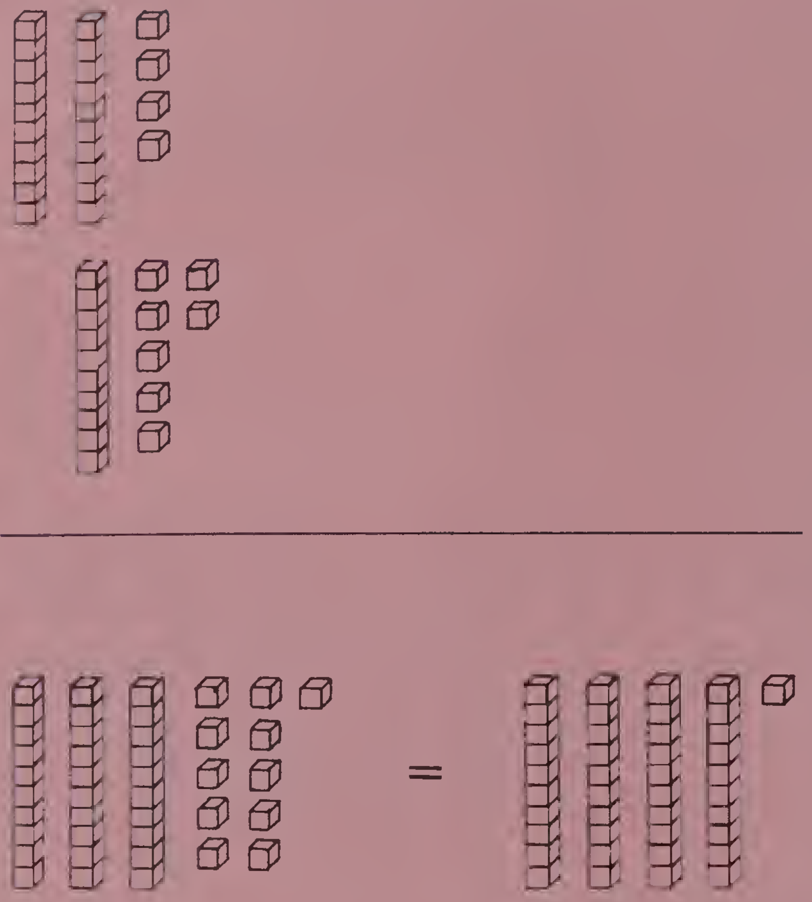
EXPLORE

Addition / 2-Digit Numbers / Regrouping

ADD.

$\begin{array}{r}24\\ 17\\ \hline\end{array}$

A



B

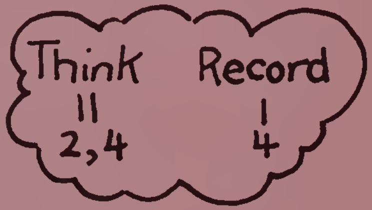
$\begin{array}{r}20 + 4\\ 10 + 7\\ \hline 30 + 11 = 40 + 1\\ = 41\end{array}$

C

$\begin{array}{r}24\\ 17\\ \hline 11\\ 30\\ \hline 41\end{array}$

D

$\begin{array}{r}24\\ 17\\ \hline 41\end{array} \uparrow$



IN ACTION

1. Add this way.

$\begin{array}{r}23 = 20 + 3\\ 58 = 50 + 8\\ \hline 70 + 11 = 80 + 1\\ = 81\end{array}$

a) $\begin{array}{r}34\\ 49\\ \hline\end{array}$ b) $\begin{array}{r}45\\ 37\\ \hline\end{array}$ c) $\begin{array}{r}56\\ 26\\ \hline\end{array}$ d) $\begin{array}{r}77\\ 18\\ \hline\end{array}$ e) $\begin{array}{r}87\\ 9\\ \hline\end{array}$ f) $\begin{array}{r}8\\ 33\\ \hline\end{array}$ g) $\begin{array}{r}16\\ 47\\ \hline\end{array}$ h) $\begin{array}{r}27\\ 55\\ \hline\end{array}$

i) $\begin{array}{r}38\\ 54\\ \hline\end{array}$ j) $\begin{array}{r}22\\ 69\\ \hline\end{array}$ k) $\begin{array}{r}43\\ 37\\ \hline\end{array}$ l) $\begin{array}{r}15\\ 19\\ \hline\end{array}$ m) $\begin{array}{r}46\\ 36\\ \hline\end{array}$ n) $\begin{array}{r}39\\ 44\\ \hline\end{array}$ o) $\begin{array}{r}47\\ 35\\ \hline\end{array}$ p) $\begin{array}{r}57\\ 23\\ \hline\end{array}$

2. Add this way.

23
58
11
70
81

a) 53	b) 35	c) 44	d) 47	e) 54	f) 46	g) 77	h) 18
28	27	39	48	38	17	9	68
i) 25	j) 39	k) 54	l) 75	m) 38	n) 77	o) 18	p) 48
65	52	17	9	28	16	62	16

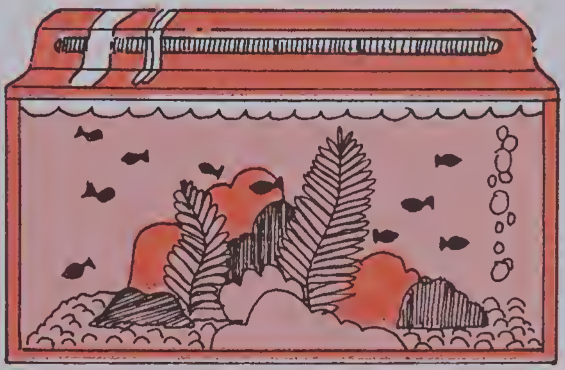
3. Add this way.

23
58
81

a) 28	b) 36	c) 48	d) 26	e) 7	f) 49	g) 11	h) 37
27	45	19	34	44	25	19	37
i) 58	j) 22	k) 29	l) 16	m) 68	n) 26	o) 57	p) 38
4	49	59	64	13	69	25	5

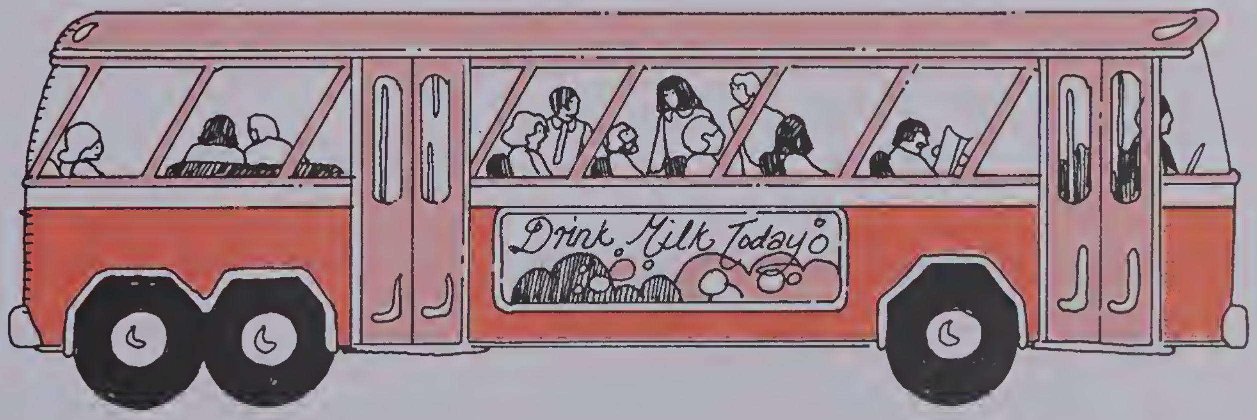
4. 39 children from Memorial School attended a baseball game. 43 children from Queen's School also came to the game. How many children attended the baseball game altogether?

5. The class in Room A has 27 guppies in its aquarium. The class in Room B has 18 guppies in its aquarium. How many guppies are in the aquariums altogether?



6. Last year, the Spartan family planted 35 apple trees to start an orchard. This year, they added 28 trees. How many trees did they plant in their orchard altogether?

7. During rush hour, the Main Street bus route has 19 buses on it. The Parkway bus route has 25 buses on it. How many buses are on the 2 routes during rush hour?



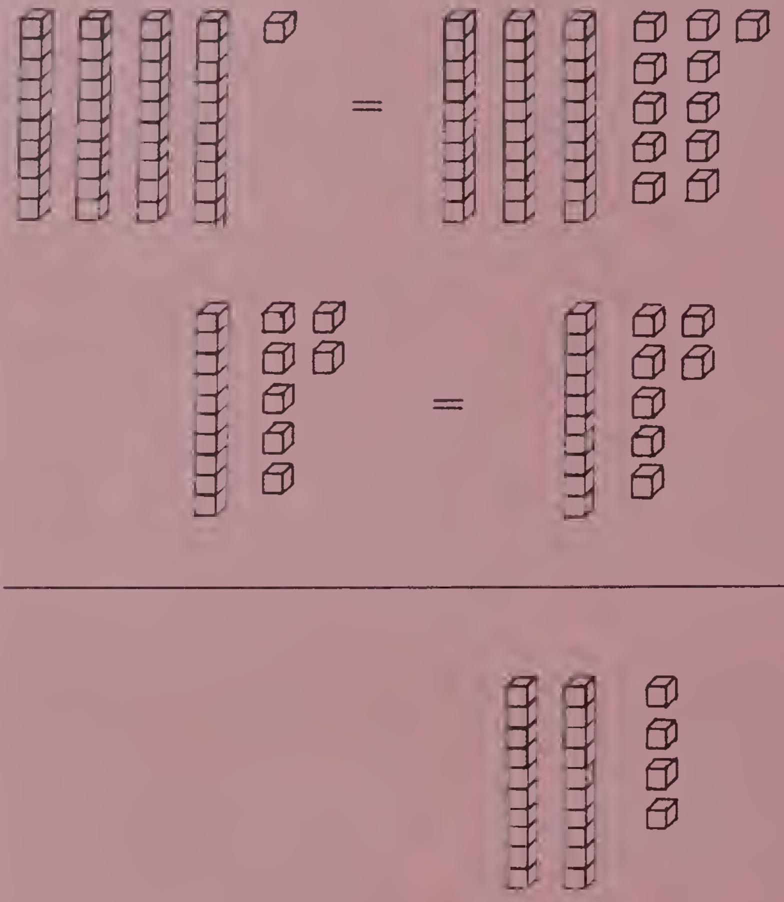
EXPLORE

Subtraction / 2-Digit Numbers / Regrouping

SUBTRACT.

41
17

A



B

40 + 1 = 30 + 11
10 + 7 = 10 + 7

20 + 4 = 24

C

41
17

24

Think Record
11, 4 4
3, 2 2

IN ACTION

1. Subtract this way.

54 = 40 + 14
26 = 20 + 6

20 + 8 = 28

a) 21 17	b) 41 29	c) 34 16	d) 72 39	e) 54 19	f) 82 46	g) 47 9	h) 91 34
i) 30 17	j) 74 57	k) 35 29	l) 44 15	m) 92 58	n) 33 17	o) 21 2	p) 55 28

2. Subtract this way.

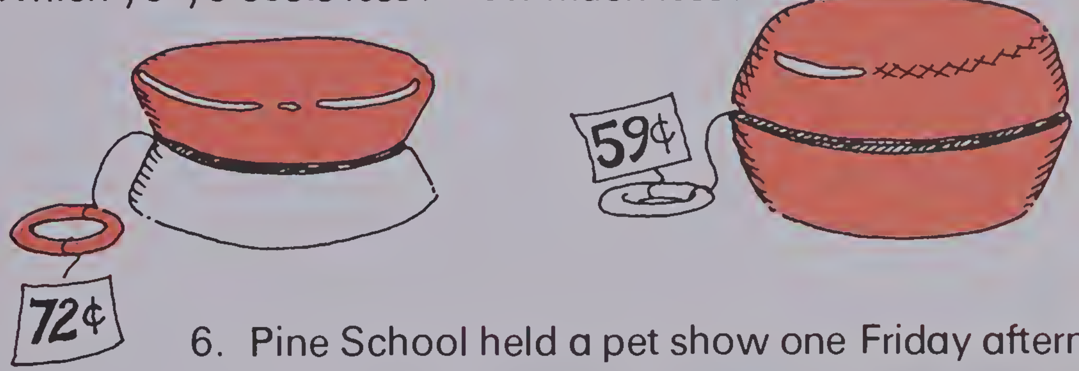
$\begin{array}{r} 54 \\ \underline{26\downarrow} \\ 28 \end{array}$

a)	b)	c)	d)	e)	f)	g)	h)
$\begin{array}{r} 42 \\ \underline{24} \end{array}$	$\begin{array}{r} 47 \\ \underline{18} \end{array}$	$\begin{array}{r} 65 \\ \underline{47} \end{array}$	$\begin{array}{r} 80 \\ \underline{13} \end{array}$	$\begin{array}{r} 30 \\ \underline{17} \end{array}$	$\begin{array}{r} 51 \\ \underline{45} \end{array}$	$\begin{array}{r} 91 \\ \underline{47} \end{array}$	$\begin{array}{r} 51 \\ \underline{19} \end{array}$

i)	j)	k)	l)	m)	n)	o)	p)
$\begin{array}{r} 44 \\ \underline{36} \end{array}$	$\begin{array}{r} 32 \\ \underline{19} \end{array}$	$\begin{array}{r} 74 \\ \underline{49} \end{array}$	$\begin{array}{r} 42 \\ \underline{16} \end{array}$	$\begin{array}{r} 57 \\ \underline{29} \end{array}$	$\begin{array}{r} 31 \\ \underline{24} \end{array}$	$\begin{array}{r} 40 \\ \underline{37} \end{array}$	$\begin{array}{r} 54 \\ \underline{37} \end{array}$

3. The Bates School marble champion has 82 marbles. The runner-up has 68 marbles. By how many marbles did the champion win?

4. Jeanette wanted to buy a new "Super-Spin" yo-yo. She saw a red one that cost 72¢ and a blue one that cost 59¢. Which yo-yo costs less? How much less?

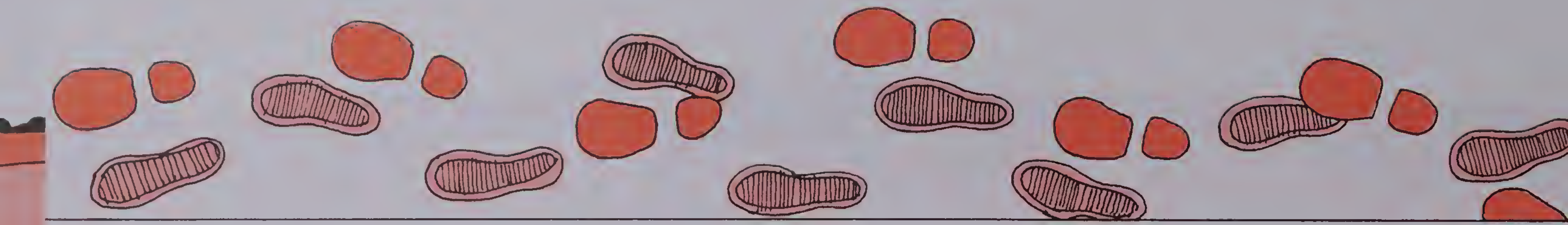


5. One Saturday, 75 children attended a Walt Disney movie. The next Saturday, 91 children saw the movie. How many more children saw the movie the second Saturday?

6. Pine School held a pet show one Friday afternoon. The children brought 36 dogs and 63 cats to the show. How many more cats than dogs were in the pet show?

7. This year, the students at St. Paul's School picked 57 tomatoes from their garden. Last year, they picked 80 tomatoes. How many more tomatoes did they pick last year?

8. A double-decker sightseeing bus holds 74 people. A touring bus holds 56 people. How many more people does the sightseeing bus hold?



Retrace Your Steps

1. Regroup. Exchange 10 for 1 or 1 for 10.
   - a) 38 or 30 + ? or ? + 18 b) 52 or ? + 2 or 40 + ?
   - c) 231 or 200 + ? + ? or 200 + ? + 11 or ? + 120 + ?
   - d) 527 or ? + 20 + ? or ? + 10 + ? or 400 + ? + ?
   - e) 600 + 170 + 14 or 600 + ? + 4 or ? + 80 + ? or ?
   - f) 300 + 180 + 16 or ? + 190 + ? or 400 + ? + ? or ?

2. Add.

a)	b)	c)	d)	e)	f)	g)	h)
49	75	27	39	38	54	58	4
43	18	64	46	32	26	37	2

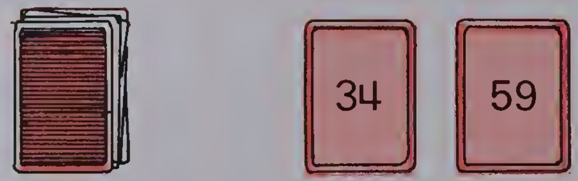
i)	j)	k)	l)	m)	n)	o)	p)
367	168	327	295	628	185	587	26
269	673	597	246	274	169	195	43

3. Subtract.

a)	b)	c)	d)	e)	f)	g)	h)
75	83	54	86	92	67	93	6
28	17	26	59	68	49	76	1

i)	j)	k)	l)	m)	n)	o)	p)
546	854	752	937	651	874	736	94
387	479	356	598	397	375	438	47

4. Play "2 Up" with a friend.
   Write 10 different 2-digit numerals on 10 cards.
   Shuffle the cards and place the deck face down.
   You and your partner each take a card.
   You add the numbers; your partner subtracts.
   The next turn, your partner adds and you subtract.
   When you have used all the cards,
   shuffle them and play again.



deck

2 cards

Add. 34
59
93

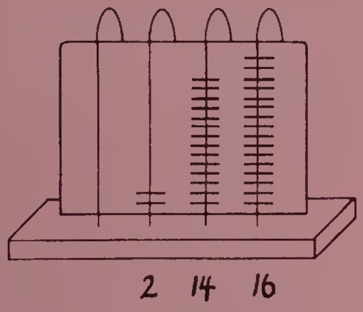
Subtract. 59
34
25

5. Play "2 Up" with another friend. For this game, write 10 different 3-digit numerals on 10 cards. The rules are the same as before.

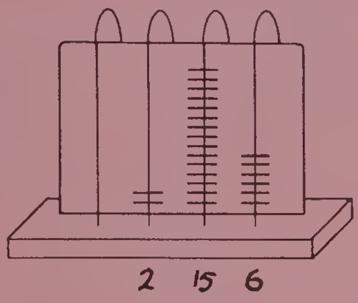
EXPLORE

Regrouping / Hundreds, Tens, and Ones

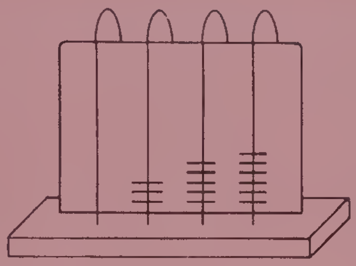
Exchanging 10 for 1



OR



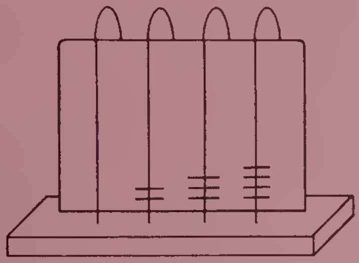
OR



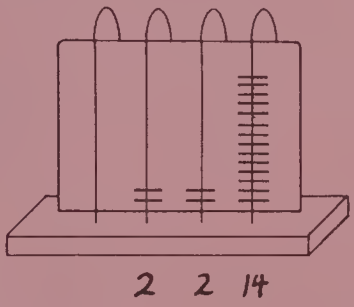
OR 356

Exchanging 1 for 10

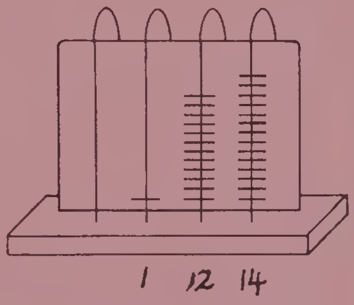
234 OR



OR



OR



300 + 160 + 12 OR 300 + 170 + ? OR 400 + 70 + 2 OR 472

647 OR 600 + ? + 7 OR 600 + 30 + 17 OR 500 + ? + 17

IN ACTION

Regroup. Exchange 10 for 1 or 1 for 10.

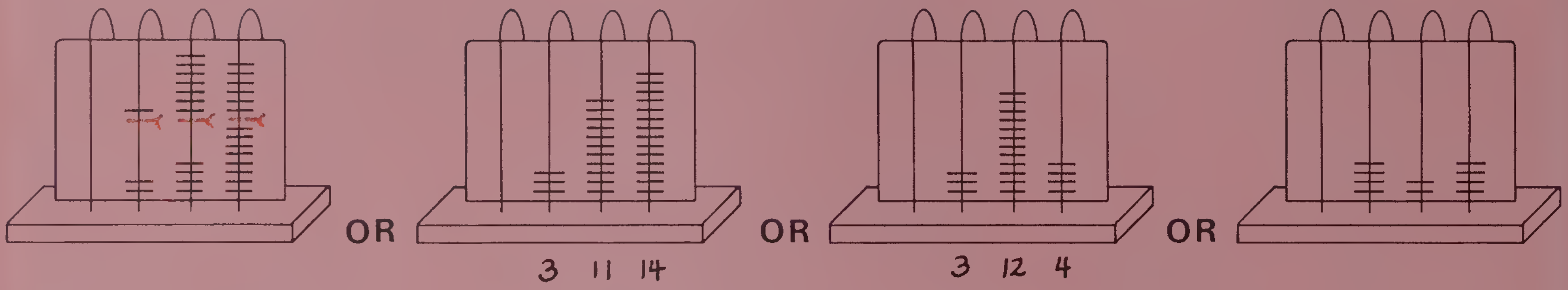
a) 800 + 130 + 16 = 800 + ? + 6 = ? + 40 + 6 = 946
b) 681 = 600 + ? + 1 = 600 + 70 + ? = 500 + 170 + 11
c) 600 + 120 + ? = 600 + 130 + 3 = 700 + 30 + 3 = ?
d) ? = 300 + 10 + 9 = 300 + ? + 19 = 200 + 100 + 19
e) 400 + ? + 17 = 400 + 120 + 7 = 500 + ? + 7 = 527
f) 295 = 200 + 90 + 5 = ? + 80 + 15 = 100 + ? + 15

Addition / 3-Digit Numbers / Regrouping

A

ADD.

$$\begin{array}{r} 248 \\ 176 \\ \hline \end{array}$$



B

$$\begin{array}{rcl} 200 + 40 + 8 & & \\ 100 + 70 + 6 & & \\ \hline 300 + 110 + 14 & = & 300 + 120 + 4 \\ & = & 400 + 20 + 4 \\ & = & 424 \end{array}$$

C

$$\begin{array}{r} 248 \\ 176 \\ \hline 14 \\ 110 \\ 300 \\ \hline 424 \end{array}$$

D

$$\begin{array}{r} 248 \\ 176 \\ \hline 424 \end{array}$$

Think	Record
14	4
8,12	2
2,4	4

IN ACTION

1. Add this way.
Exchange 10 for 1.

$$\begin{array}{rcl} 237 = 200 + 30 + 7 & & \\ 584 = 500 + 80 + 4 & & \\ \hline 700 + 110 + 11 & = & 700 + 120 + 1 \\ & = & 800 + 20 + 1 \\ & = & 821 \end{array}$$

a)	b)	c)	d)	e)	f)	g)
345	459	567	777	877	86	163
497	374	266	185	96	336	478

h)	i)	j)	k)	l)	m)	n)
278	208	189	226	155	467	394
557	534	372	696	197	368	449

2. Add this way.

237
584
11
110
700
821

a)	b)	c)	d)	e)	f)	g)
538	188	357	779	449	467	478
284	687	276	94	397	175	488

h)	i)	j)	k)	l)	m)	n)
548	258	489	396	187	542	772
384	658	275	527	624	178	169

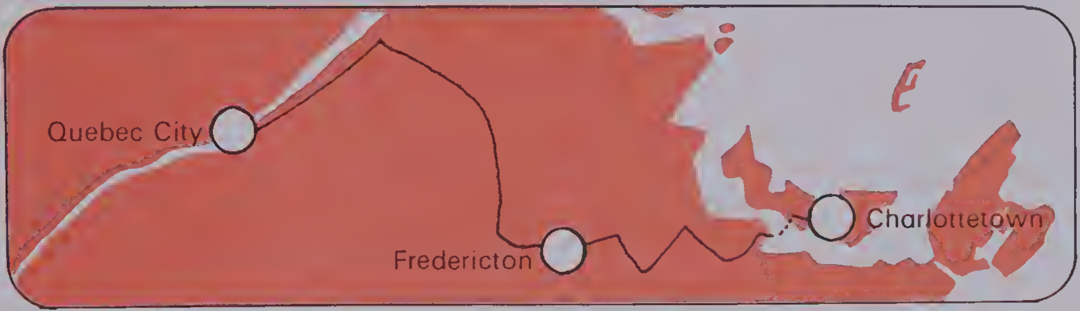
3. Add this way.

237
584 ↑
821

a)	b)	c)	d)	e)	f)	g)
284	374	365	119	489	495	267
277	376	459	198	191	256	347

h)	i)	j)	k)	l)	m)	n)
77	587	273	229	269	685	164
448	46	258	496	692	137	378

4. It is 371 km from Quebec City to Fredericton and 268 km from Fredericton to Charlottetown. How long is the trip from Quebec City to Charlottetown?



5. The first hole on the Markway Golf Course is 395 m long. The second hole is 475 m long. What is the combined length of the first 2 holes?

6. Westown School library has 279 science books and 486 fiction books. How many science and fiction books are there altogether?

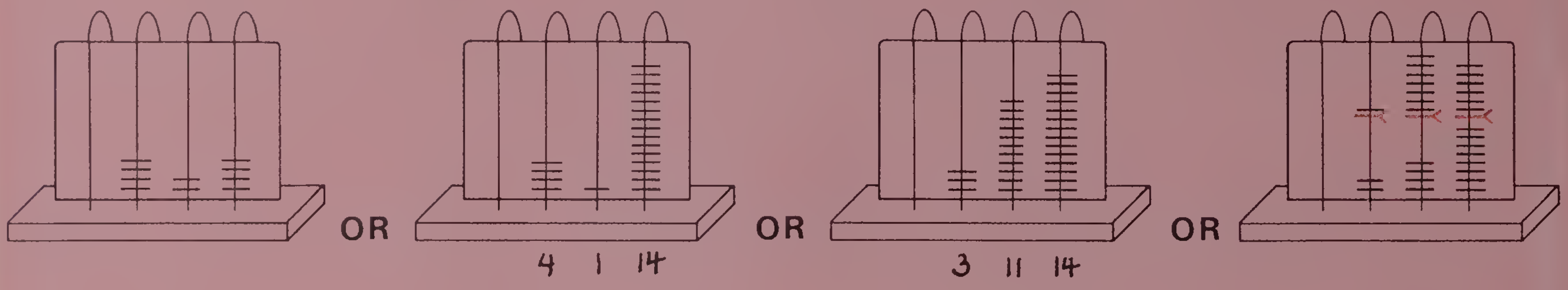
EXPLORE

Subtraction / 3-Digit Numbers / Regrouping

A

SUBTRACT.

424
176



B

400 + 20 + 4 = 400 + 10 + 14 = 300 + 110 + 14
100 + 70 + 6 = 100 + 70 + 6 = 100 + 70 + 6
200 + 40 + 8 = 248

C

424
176
248

Think	Record
14, 8	8
11, 4	4
3, 2	2

IN ACTION

1. Subtract this way. Exchange 1 for 10.

821 = 800 + 20 + 1 = 800 + 10 + 11 = 700 + 110 + 11
584 = 500 + 80 + 4 = 500 + 80 + 4 = 500 + 80 + 4
200 + 30 + 7 = 237

a) 211 174	b) 417 299	c) 342 166	d) 724 399	e) 542 199	f) 824 466	g) 471 99	h) 911 347
i) 308 175	j) 741 572	k) 353 297	l) 442 158	m) 924 585	n) 335 179	o) 214 127	p) 580 257

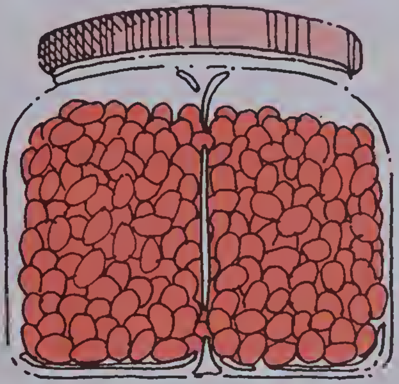
2. Subtract this way.

$$\begin{array}{r} 821 \\ 584\downarrow \\ \hline 237 \end{array}$$

a)	b)	c)	d)	e)	f)	g)	h)
916	513	615	554	693	523	462	838
87	164	338	368	396	175	395	689

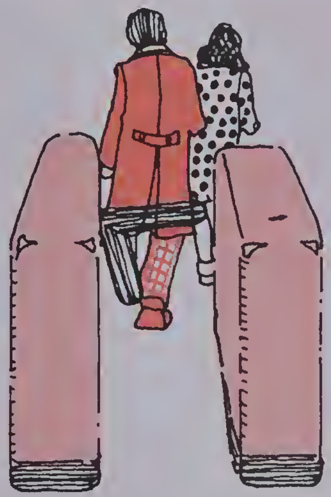
i)	j)	k)	l)	m)	n)	o)	p)
514	910	511	307	802	654	472	424
197	477	454	179	136	479	189	246

3. Gina tried to estimate the number of jumping beans in a jar. She estimated 842 beans, but there actually were 757 beans in the jar. How close was Gina's estimate?

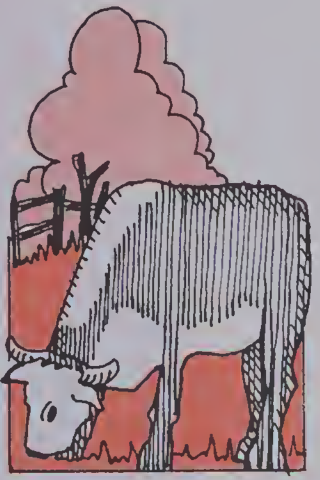


4. The students of Beth School collected bottles for recycling. One week they collected 303 bottles. The next week they collected 189 bottles. How many more bottles did the students collect the first week?

5. In one subway station, 215 people went through the turnstiles in 5 minutes. 136 people went through the turnstiles in the next 5 minutes. How many more people went through the turnstiles in the first 5 minutes?



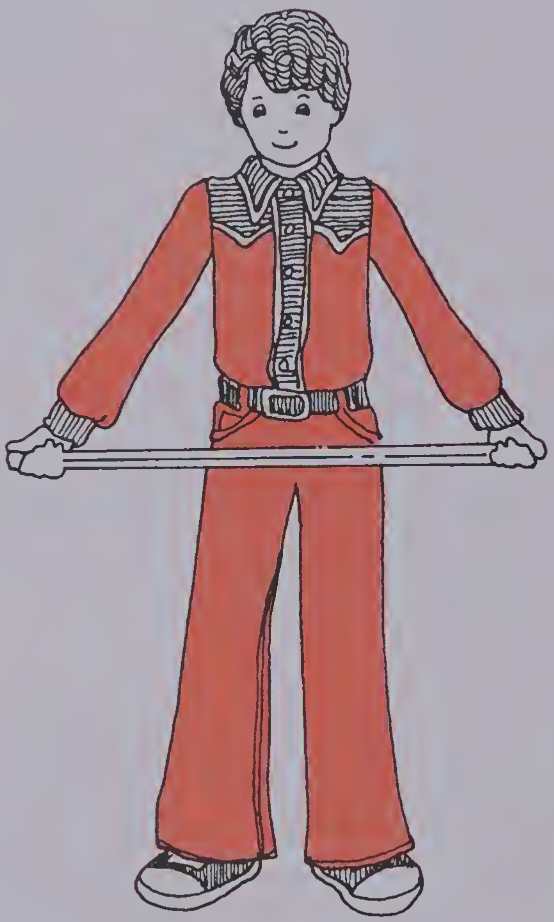
6. There were 530 beef cattle on the ranch. One day, the ranch owner took 175 of the cattle to market. How many cattle were left on the ranch?



7. Last week, the poultry farm sold 178 cartons of eggs. This week, the farm sold 202 cartons of eggs. How many more cartons of eggs did the farm sell this week?

8. Anita earned $88 in a "Metres for Millions" walkathon. Kim earned $121 in the walkathon. How much more did Kim earn?

The Metre m

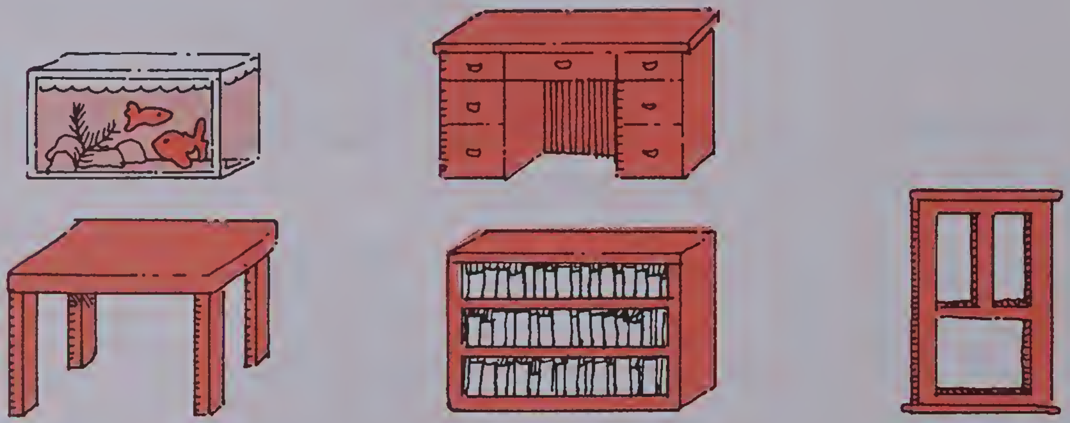


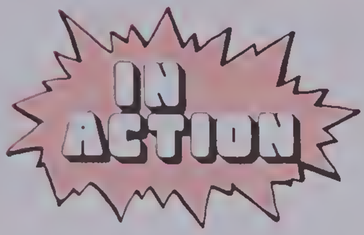
Try to get a good concept of the length of I m (one metre).

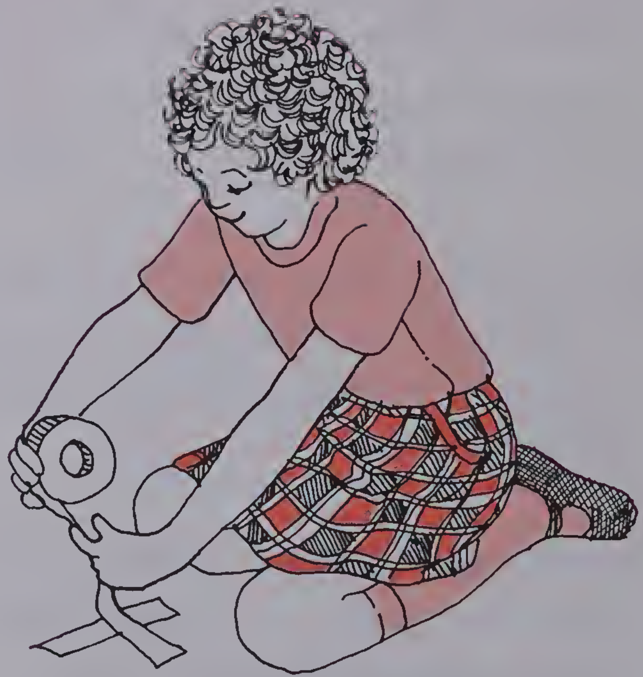
Hold a metre stick so that one end is in each hand.
Your hands are I m apart.

Make a list of 5 things in your class that you think are about I m long.

As you go, check the length of each one with a metre stick. That way, your estimates should get closer and closer.





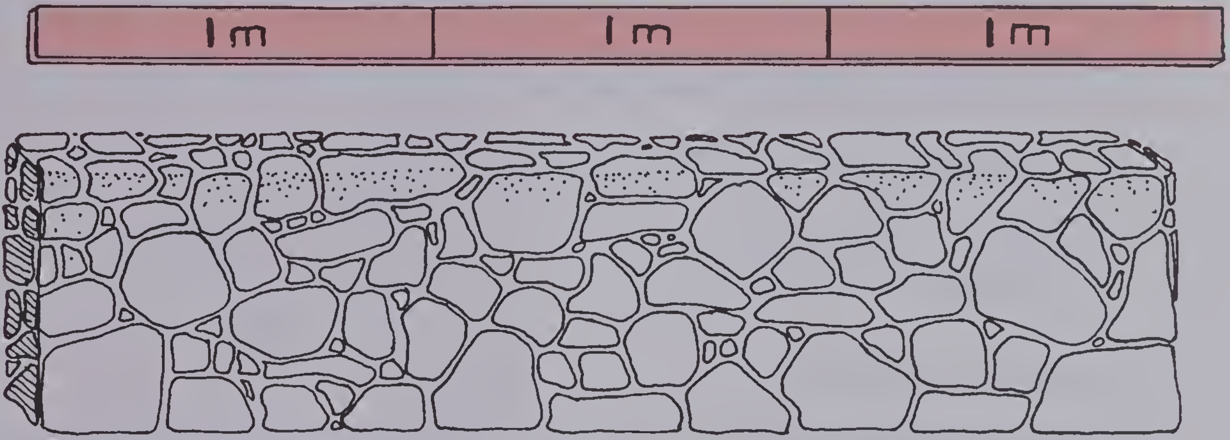


I. Mark a spot on the floor with tape. Look at a metre stick again.

Mark the places you think would be
a) 2 m from the spot,
b) 3 m from the spot,
c) 5 m from the spot.

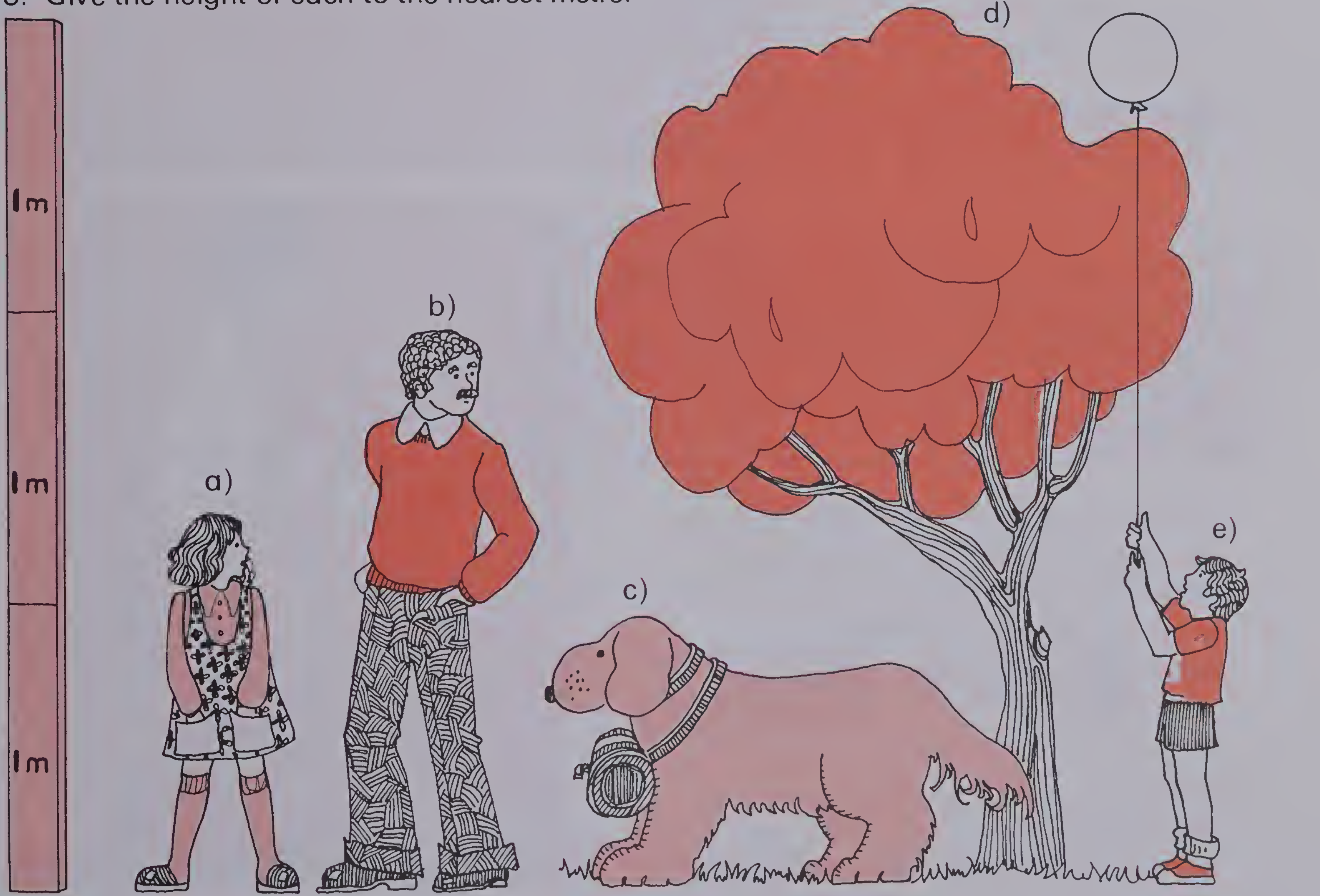
Check, with a metre stick, after marking **each** distance. That way, your estimates should improve.

2. The length of the wall is
   more than 2 m,
   but less than 3 m.



a) Is the length of the
   wall closer to 2 m or 3 m?
b) Give the length of the wall
   to the nearest metre.

3. Give the height of each to the nearest metre.



4. Cut a piece of string 1 m long. Estimate, to the nearest metre, the height of a door. Record your estimate. Use your string to check your estimate.

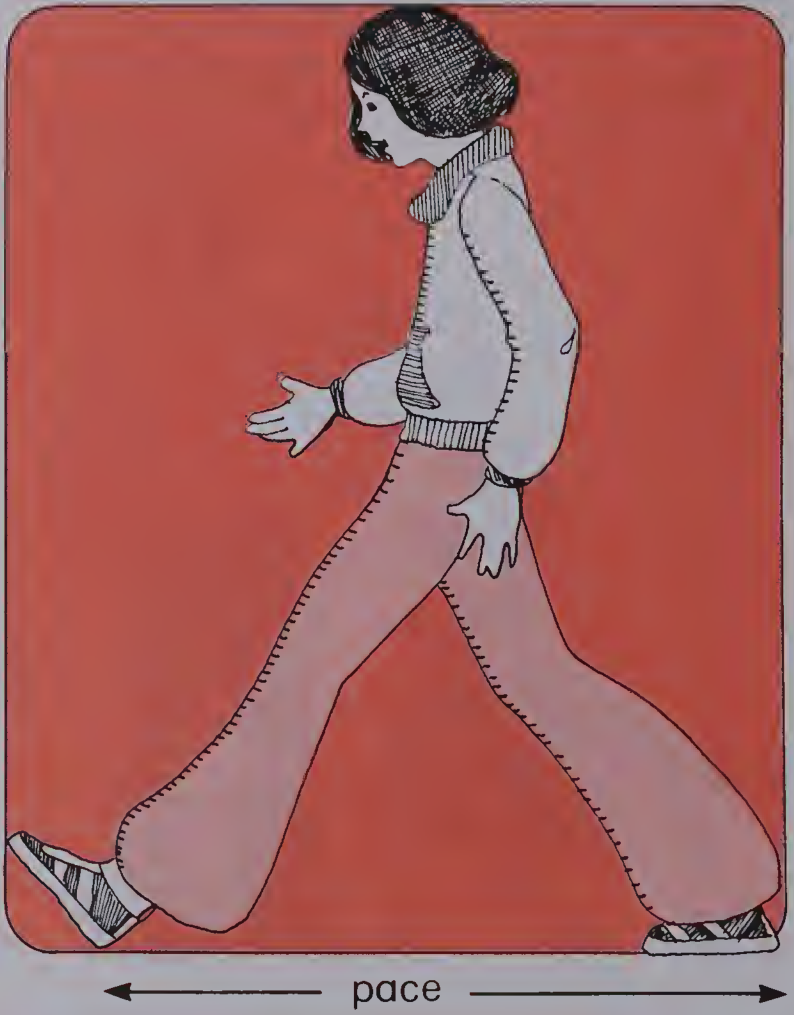
   Repeat these steps for each object listed.

   Complete the chart in your notebook.

Object	Estimated length (nearest metre)	Measured length (nearest metre)
Height of door		
Length of teacher's desk		
Length of chalkboard		
Width of hall		
Height of window		
Width of classroom		
Length of classroom		

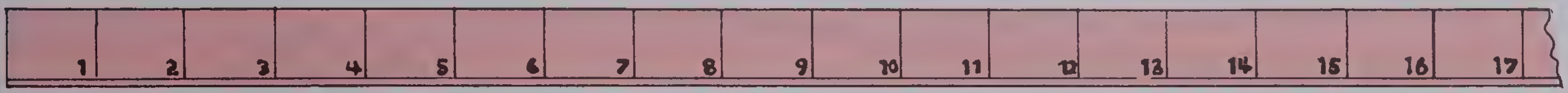
5. Take 5 paces. Measure from the starting point to the finishing point, to the nearest metre. Repeat several times so that you can always make your paces about the same size.

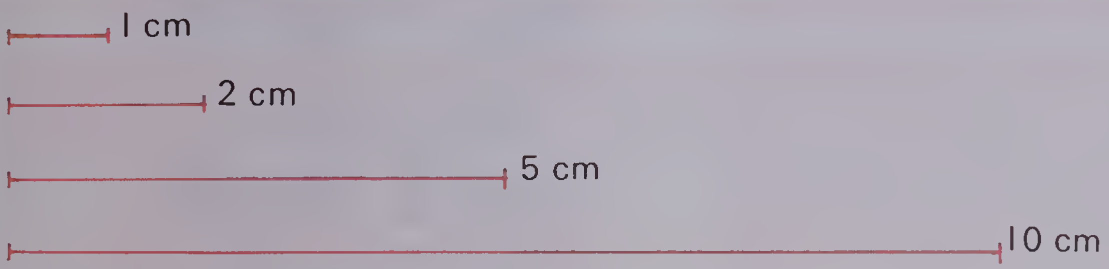
   Estimate, then pace, then measure the length of a hall in your school. How close to the measured length were your estimate and pacing measurements?



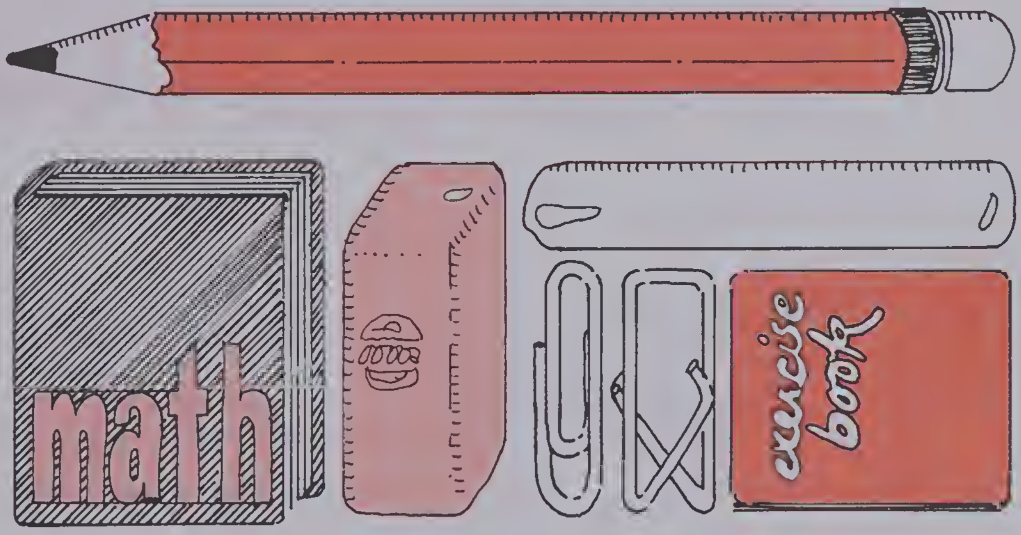
EXPLORE

The Centimetre cm


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17


1 cm
2 cm
5 cm
10 cm

Look at the ruler. Study the length of each line segment.
Try to get a good mental picture of
1 cm, 2 cm, 5 cm, and 10 cm.


math
exercise book

List objects in your classroom that have lengths of about 2 cm, 5 cm, and 10 cm.

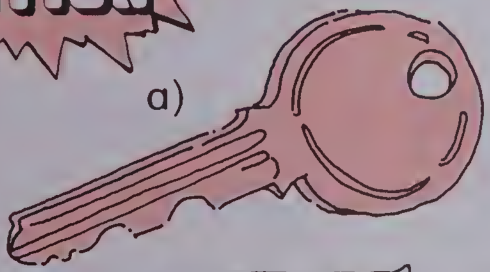
Draw a line segment that you think is 5 cm long.
Measure it.
How close did you come?

Do the same thing for 1 cm, 2 cm, and 10 cm.

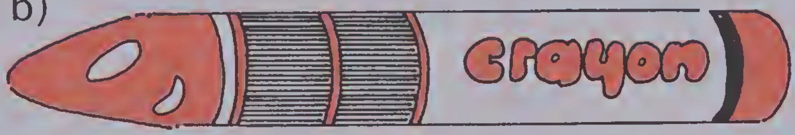
IN ACTION

1. Find the lengths, in centimetres, of each object.

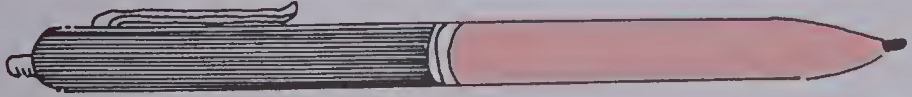
a)



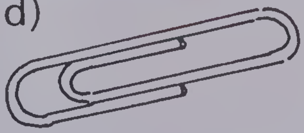
b)



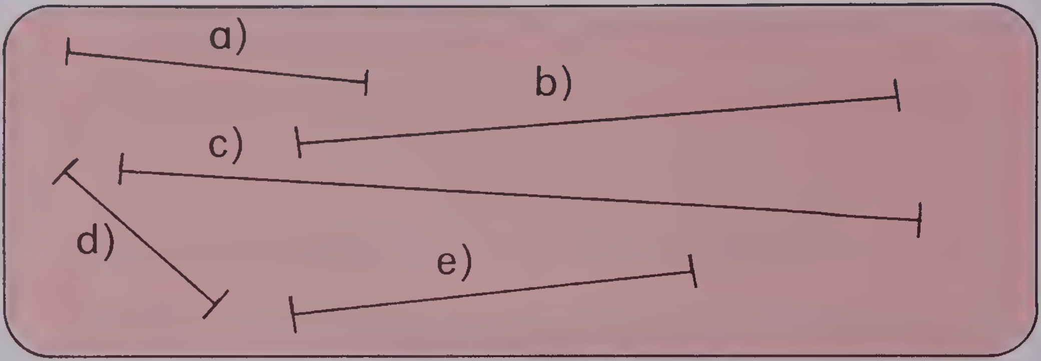
c)



d)



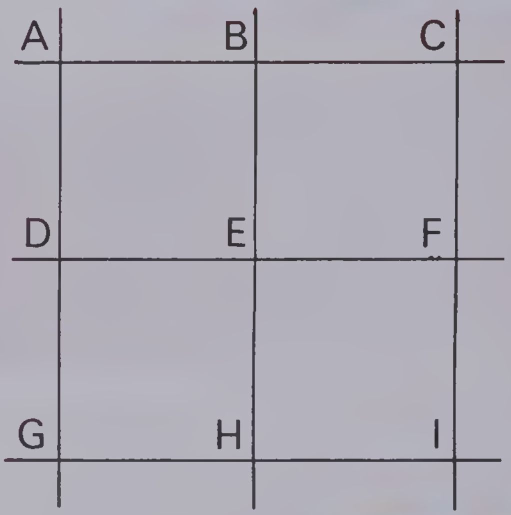
2. Look at a line segment. How long do you think it is?
Record your estimate, then measure.
Complete a chart in your notebook.



LOOK
ESTIMATE
RECORD
MEASURE
RECORD

Line segment	Estimated length	Measured length
a)	? cm	? cm

3.



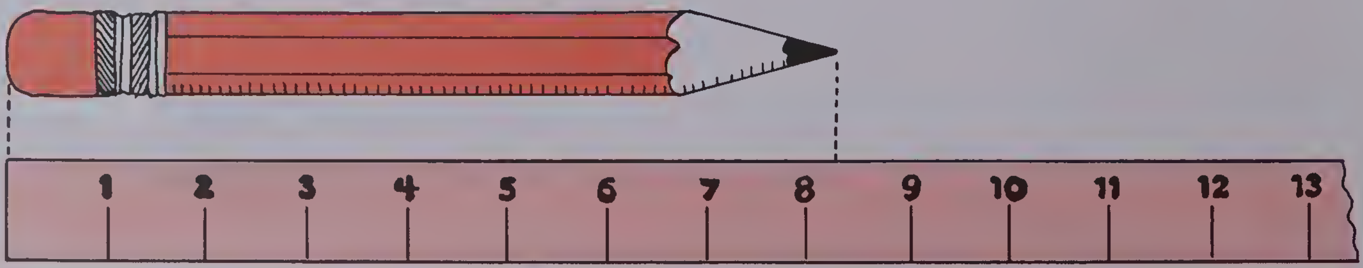
a) Find a path from A to H that is 6 cm in length.

b) Find another path from A to H that is 10 cm long.

c) What is the length of the longest path you can find between A and H?

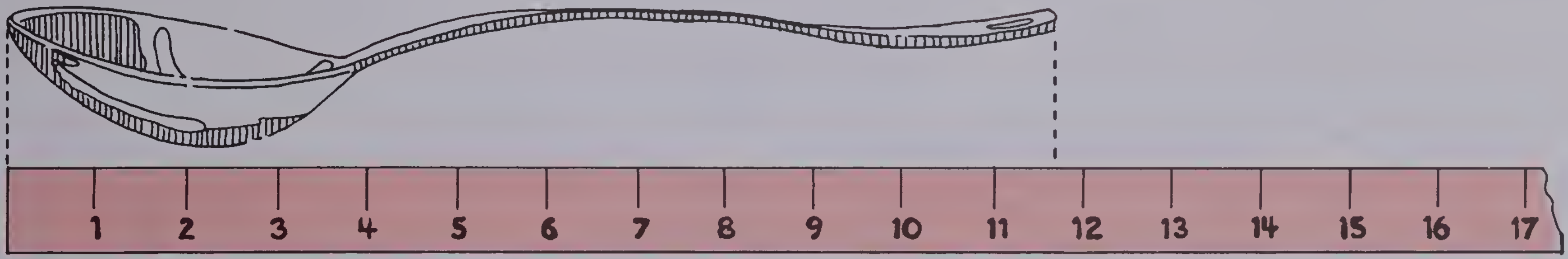
Don't retrace your steps!

4. The length of the pencil is more than 8 cm, but less than 9 cm.



a) Is the length of the pencil closer to 8 cm or 9 cm?

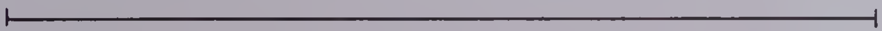
b) Give the length of the pencil **to the nearest centimetre.**

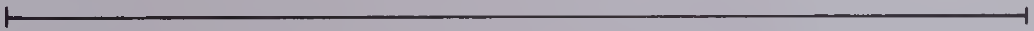

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

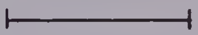
5. a) Is the length of the spoon closer to 11 cm or 12 cm?

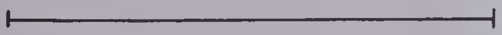
   b) Give the length of the spoon to the nearest centimetre.

6. Measure each line segment to the nearest centimetre.

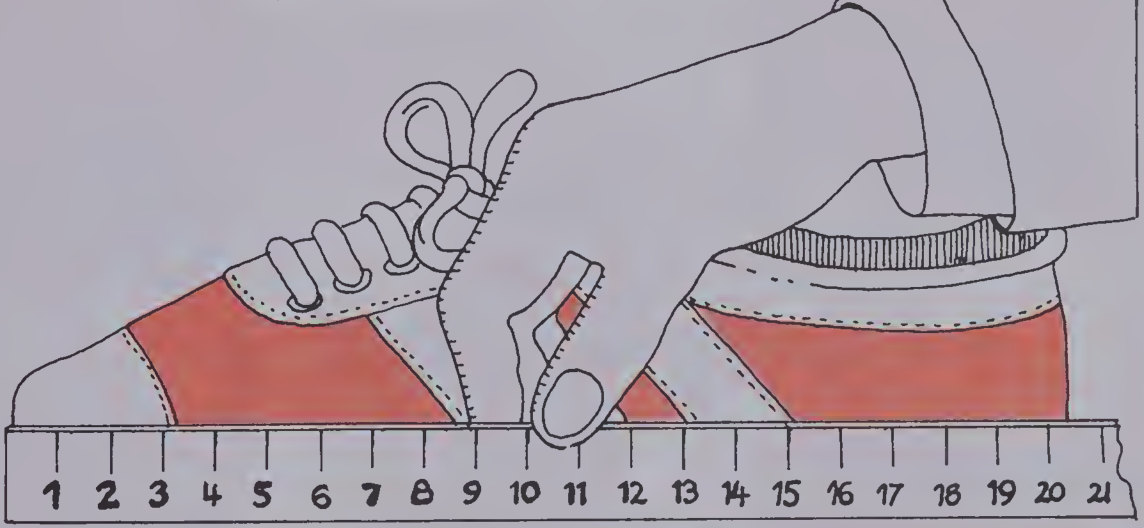
a) 

b) 

c) 

d) 

7. Look at your shoe.
   Estimate its length
   to the nearest centimetre.
   Record your estimate.
   Now measure to
   the nearest centimetre.
   How close were you?

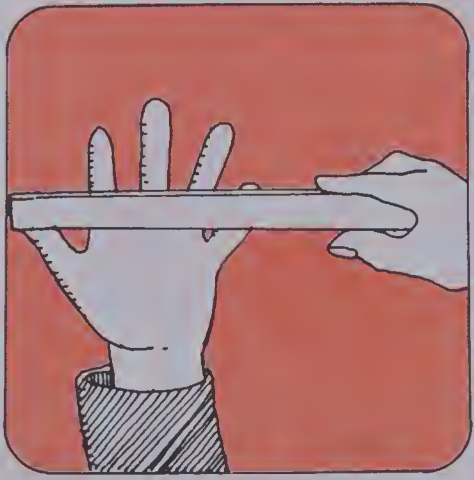

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

Remember!

LOOK
ESTIMATE
RECORD
MEASURE
RECORD

Repeat for each of these.

a) the length of your hand span
b) the length of a pencil
c) the width of a book
d) the height of a friend
e) the height of your teacher
f) the width of a desk



A Belt for Your Classroom

Cut a strip of paper 1 m long.
If you need help, cut your paper
5 times as long as the coloured strip
at the side of this page. You may need
to tape 5 of these strips end-to-end.

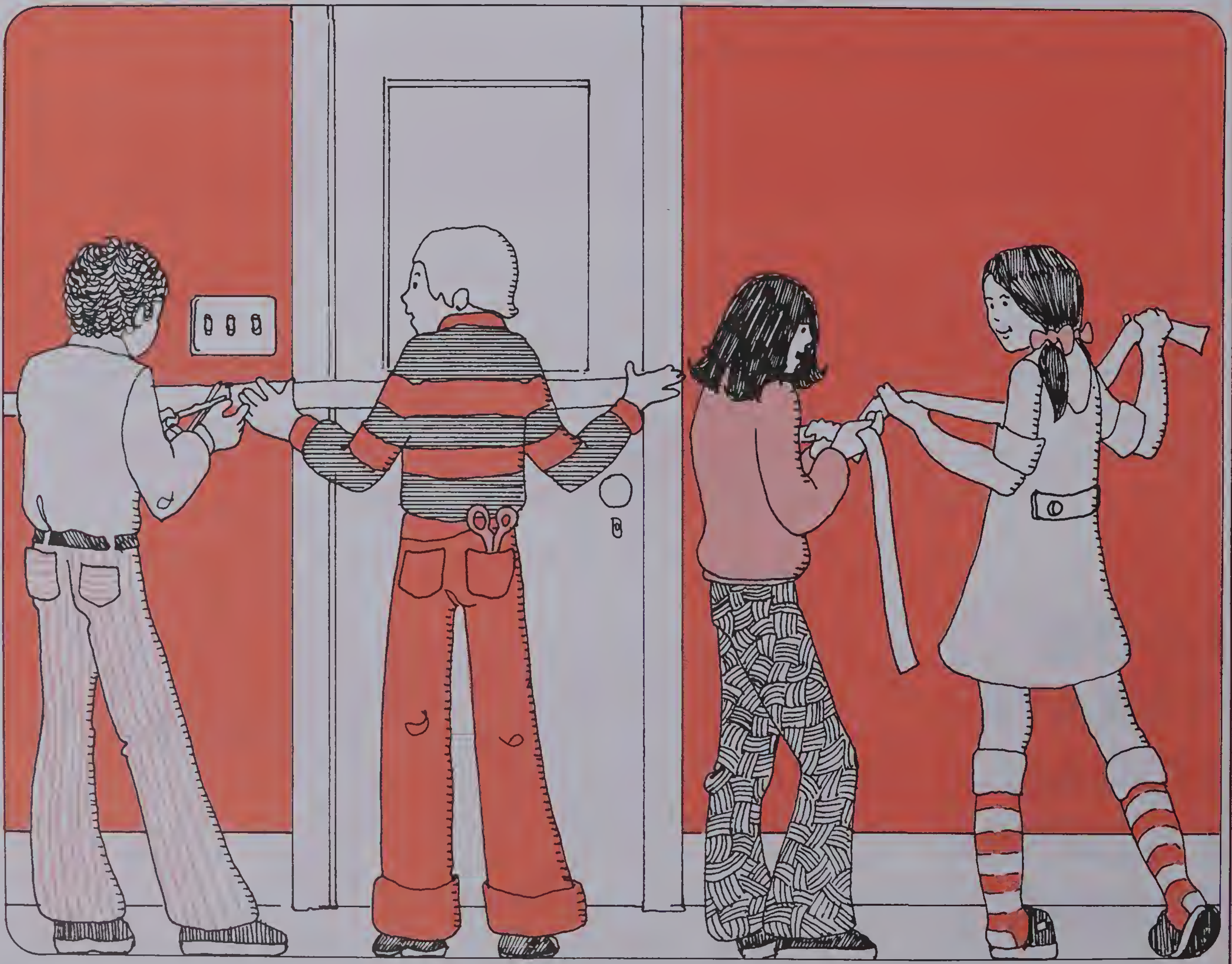
Your strip will be 1 m long.

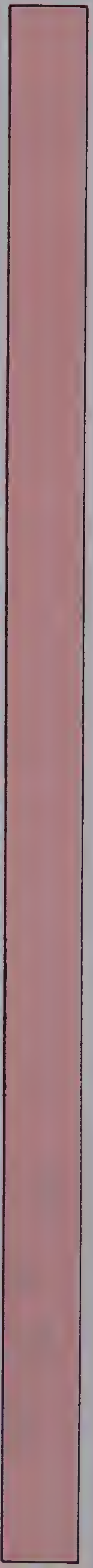
Label your strip "1 m".

When all the children in your class
have cut their strips, fasten the strips
to the walls of your classroom
so that they form a long belt
around the room.

Cut the long strip so that all doors can open.

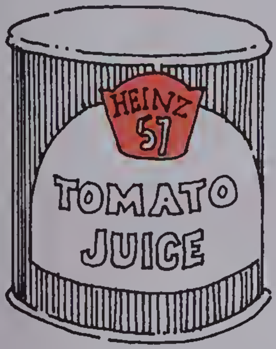
What is the distance around your classroom?



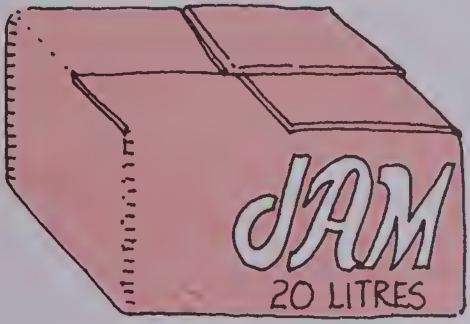


Perimeter

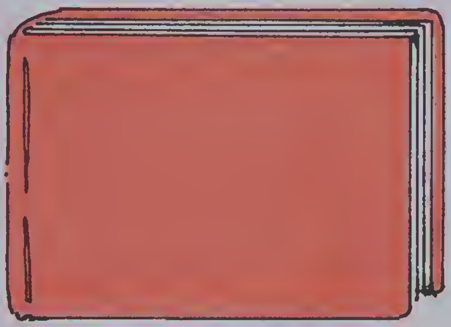
Use a string and a ruler
to find the distance around each object.
Record each length.


HEINZ
57
TOMATO
JUICE

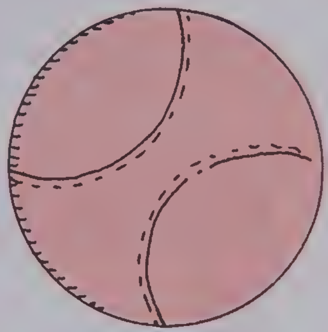
a) a tin can


JAM
20 LITRES

b) a cardboard box

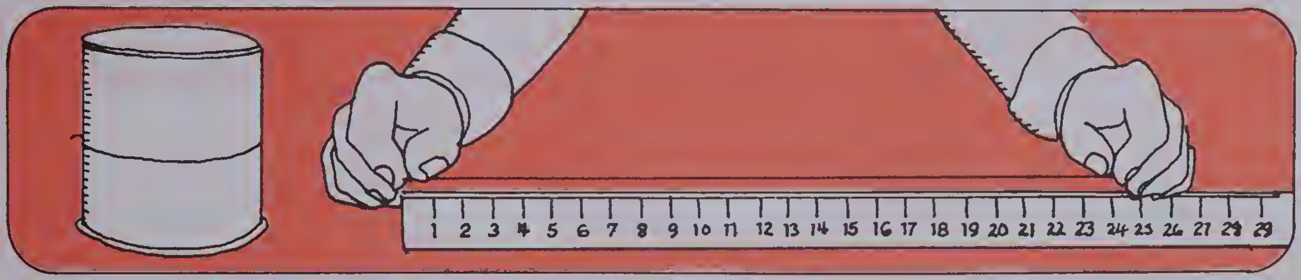


c) a book

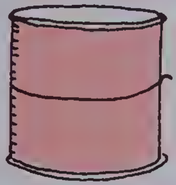


d) a ball

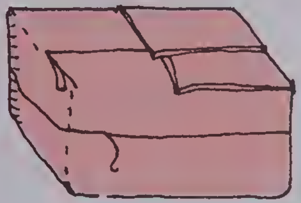
The distance around an object
is called its **perimeter**.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

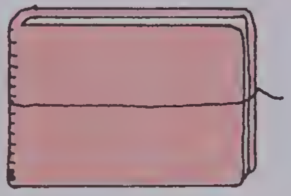
What is the perimeter of



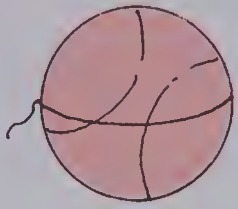
a) the tin can?



b) the box?



c) the book?

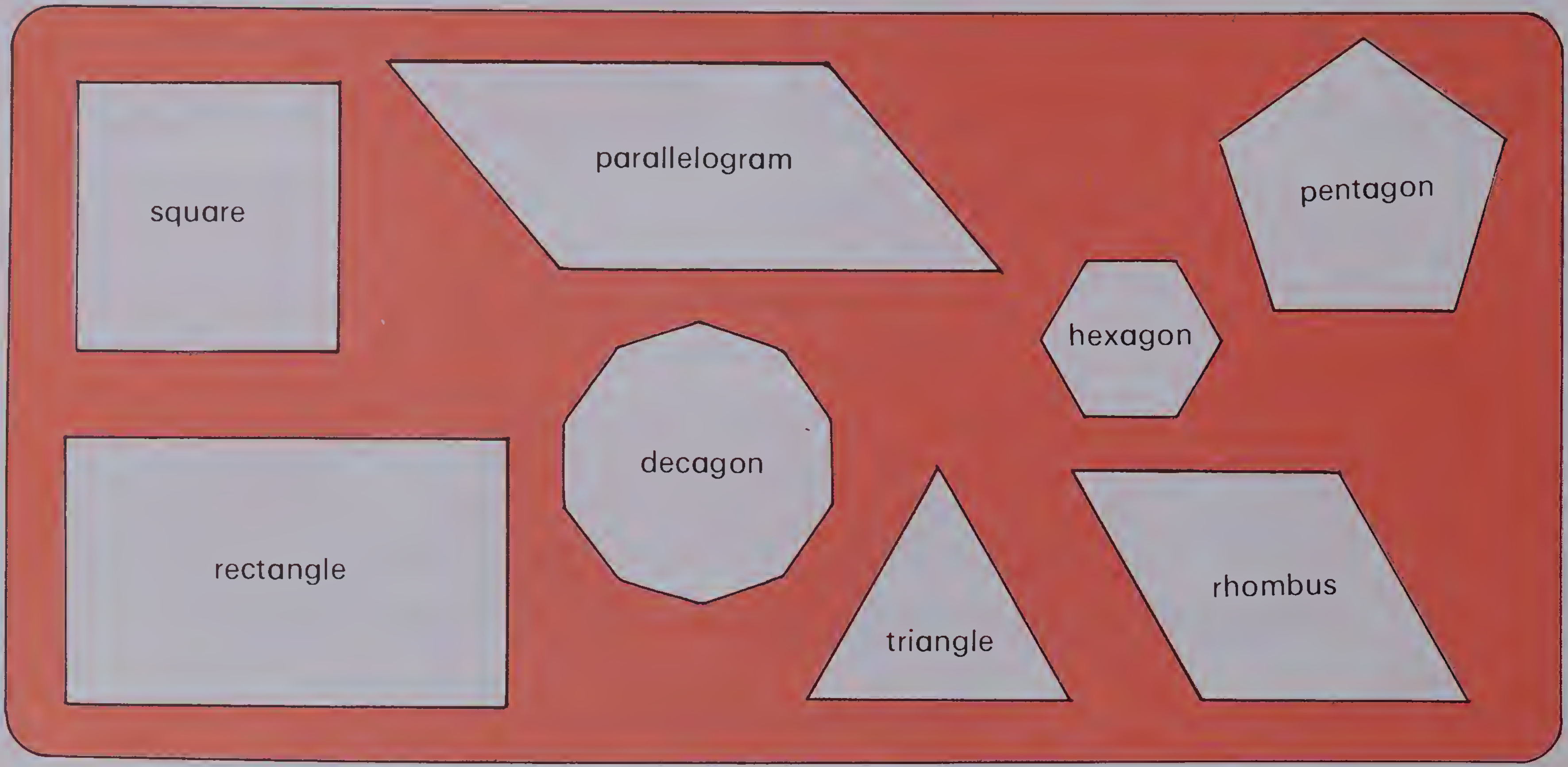


d) the ball?

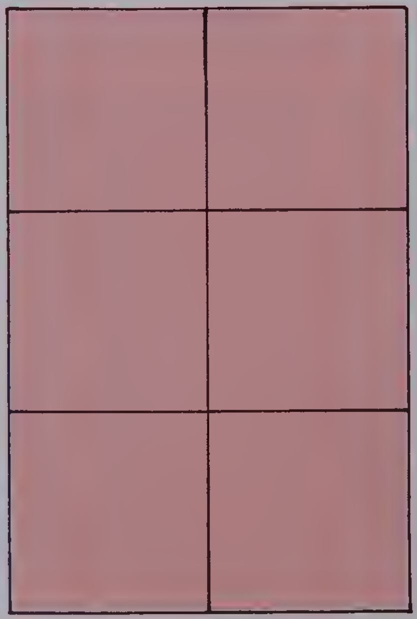
IN ACTION

1. Draw a square with each side 6 cm long.
Use a sheet of paper
to help you get square corners.
What is the perimeter of the square?

2. a) Which figure has a perimeter of 9 cm?
   b) Which figure has a perimeter of 6 cm?
   c) Which 2 figures each have a perimeter of 16 cm?
   How are these 2 figures different?
   d) What is the total perimeter of the rhombus and the square?
   e) Which 2 figures each have a perimeter of 10 cm?


square
parallelogram
pentagon
hexagon
decagon
rectangle
triangle
rhombus

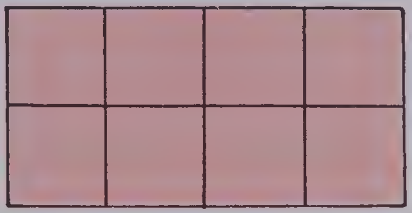
3. Here are 6 squares that form a rectangle.
The side of each square is 2 cm long.
What is the perimeter of the rectangle?
Draw and cut out 6 square shapes this size.
Arrange them so that they have
a perimeter of 24 cm.
How many different perimeters
can you create? Draw pictures
of your shapes to keep a record.
Compare your record with the one
made by another member of your class.



EXPLORE

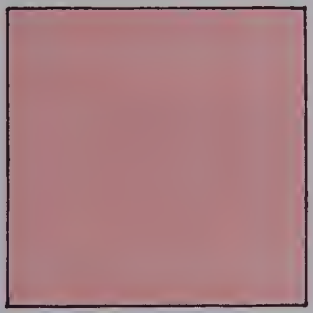
Area

To find the area of a surface we can count squares.
What is the area of this rectangular shape?



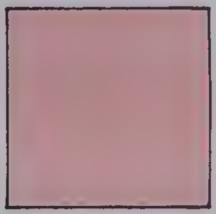
The area of the rectangular shape is
8 square units.

A
Cut out some
squares this size.

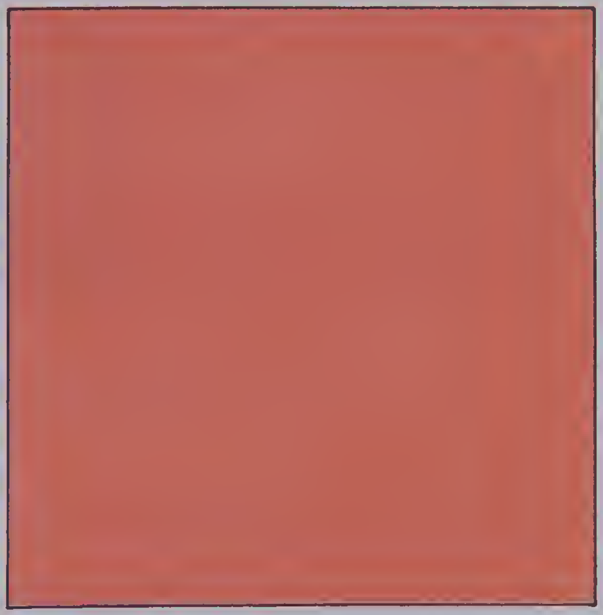


How many squares
do you need to cover
the large shape?

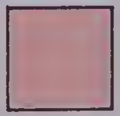
B
Now cut out some
squares this size.



How many of these
squares do you
need to cover the large shape?



C
Here is a smaller square.

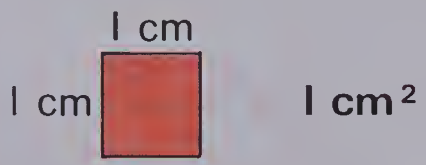


How many of these
do you think you would need
to cover the large shape?
Show that your estimate is a good one.

Why do you need
a different number of each square
to cover the same surface?

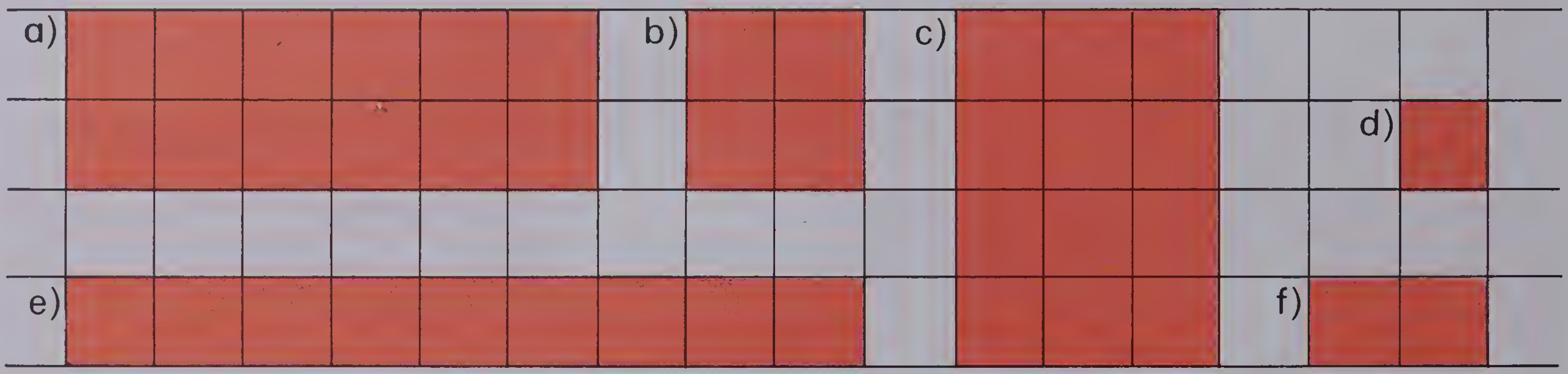
IN ACTION

We can use this unit
to measure small areas.

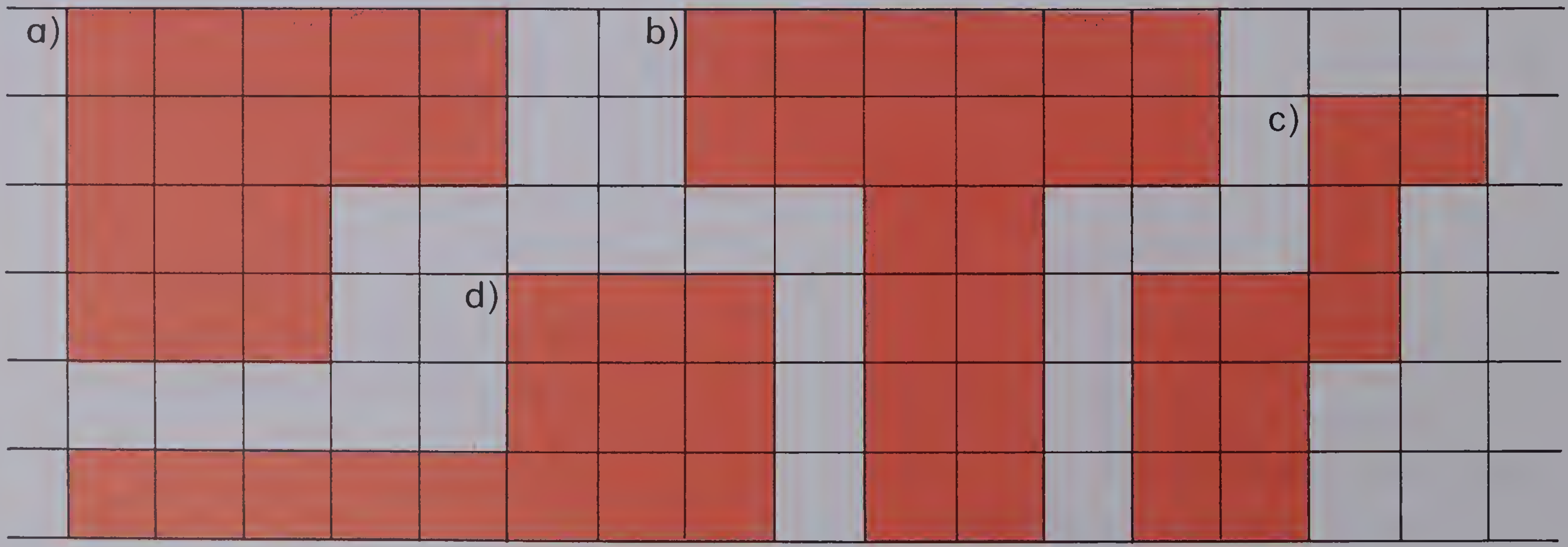

1 cm
1 cm
1 cm²

the square centimetre

1. Find the number of square centimetres in each shape.
We write cm² for "square centimetres".



2. Find the area of each shape in square centimetres.

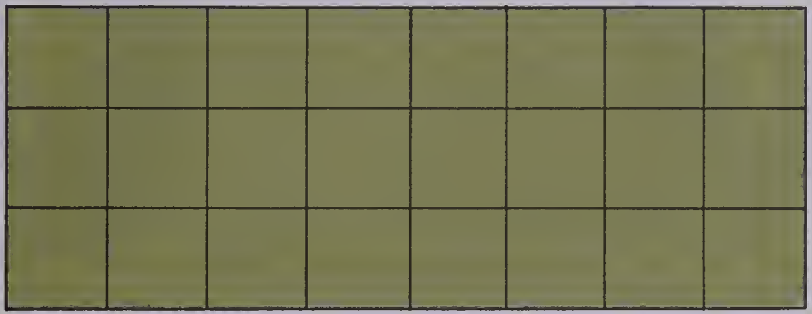


3. Draw a rectangular shape that has an area of 10 cm².
How long is the shape?
How wide is it?

4. Draw a rectangular shape with an area of 20 cm².
How long is the shape?
How wide is it?

Did anyone draw a shape
with length and width
different from yours?

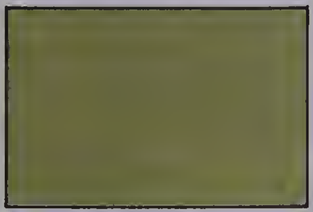
5. Here is 1 rectangular shape with an area of 24 cm².



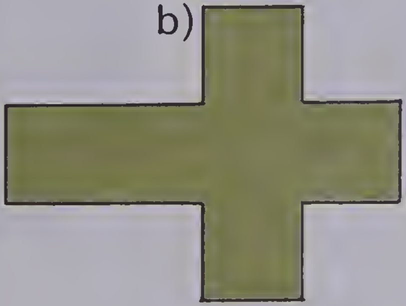
Draw as many different
rectangular shapes as you can
with an area of 24 cm².

6. Which of these shapes have an area of 6 cm²?
To help you decide, cut out six 1 cm squares
from graph paper.

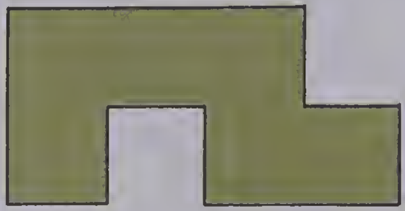
a)



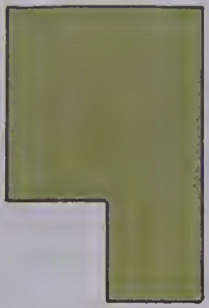
b)

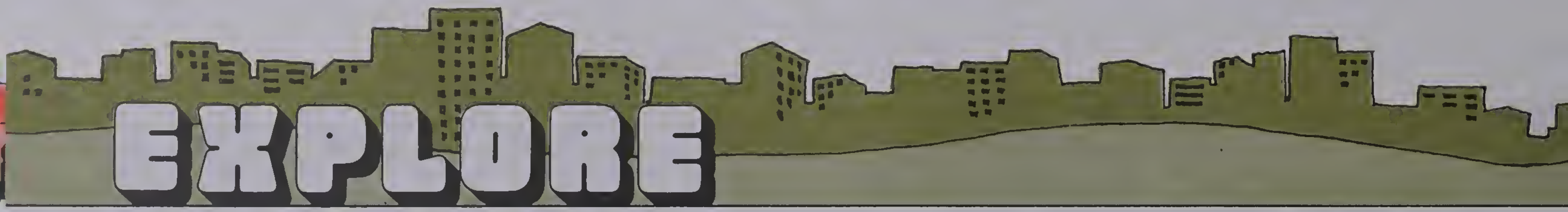


c)



d)

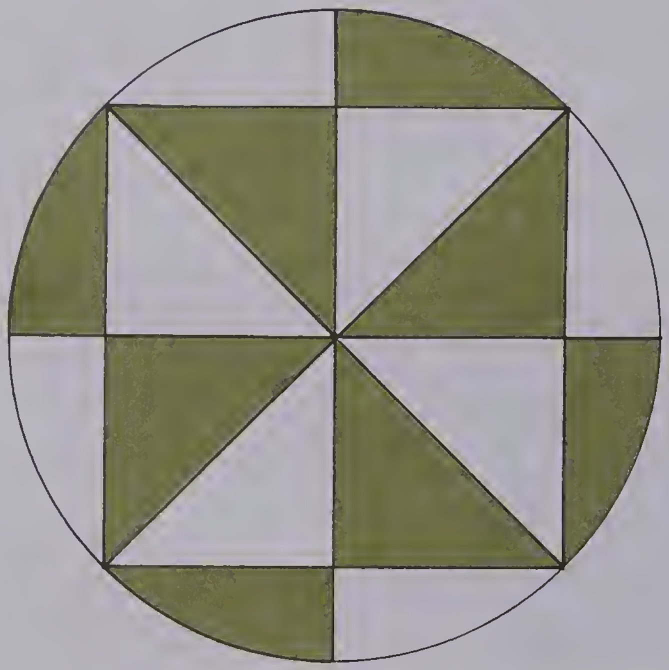




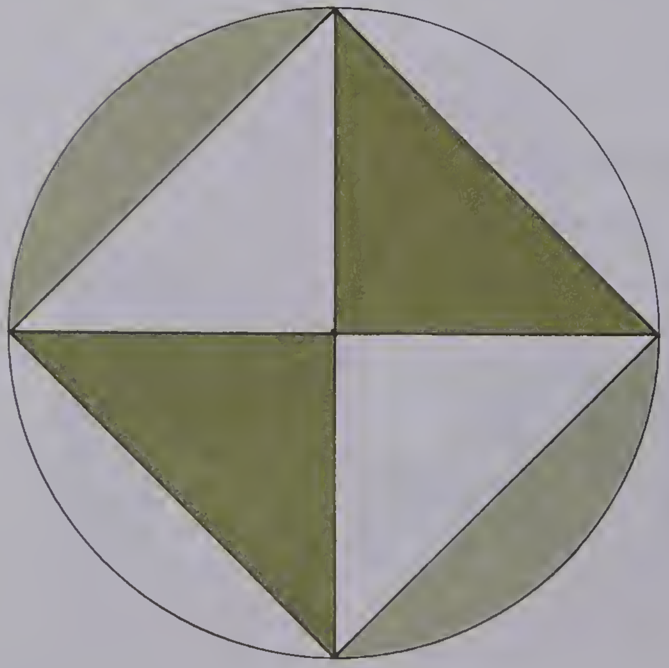
Circular Shapes

Trace and cut out a circular shape.
Fold your shape in an interesting way.
Now open the shape and colour the pattern.

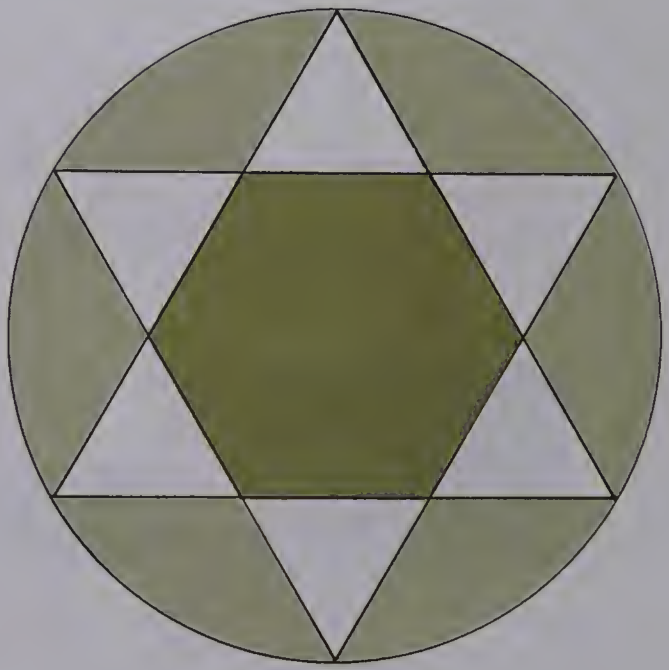
Cut out some circular shapes.
Fold and colour the shapes
to make different interesting patterns.



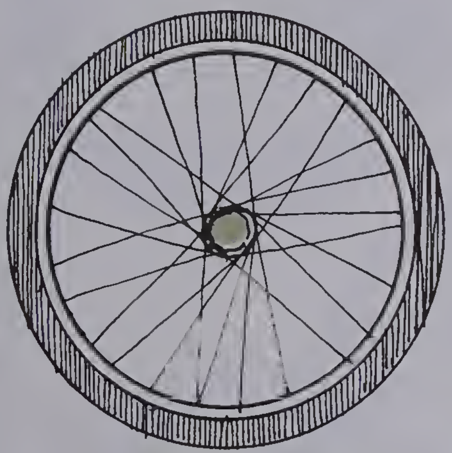
Make a display of your work.

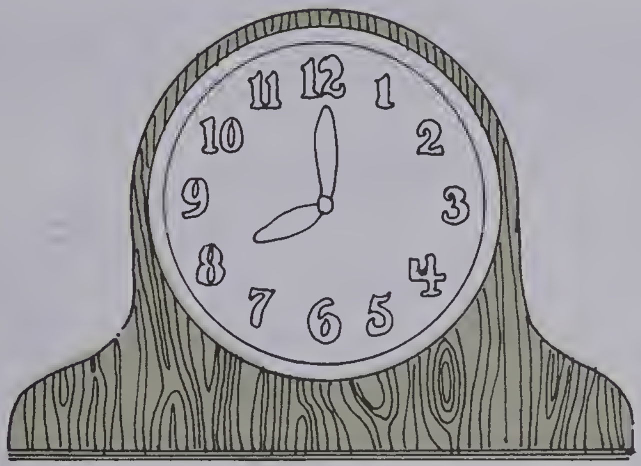


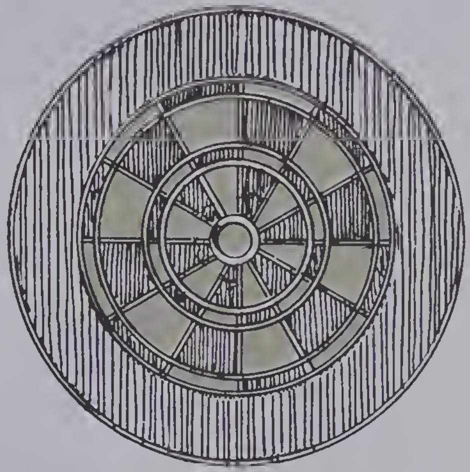
Can you discover
how to fold
circular shapes
to create
the patterns
on this
page?

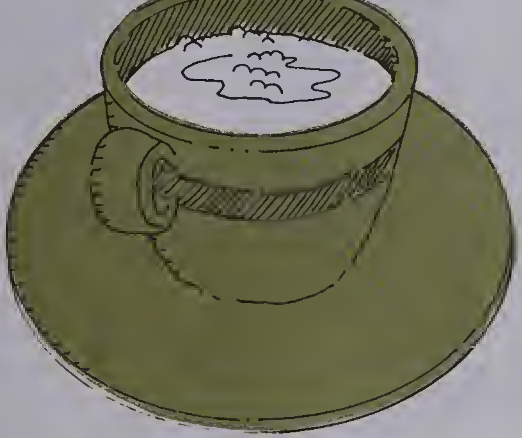


We use circular shapes in many different ways. Think about your day—
from the time you get up until you go to bed.
Make a list of the things you use in a day that are circular.

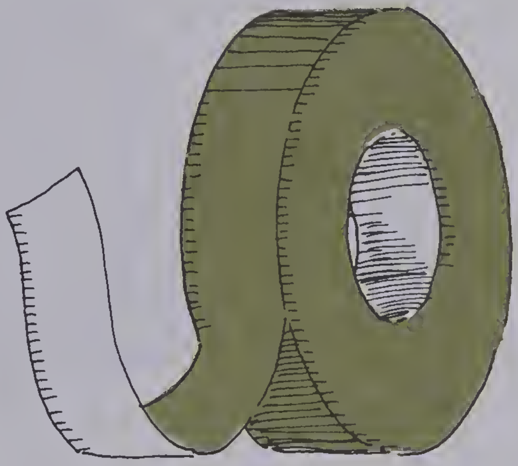




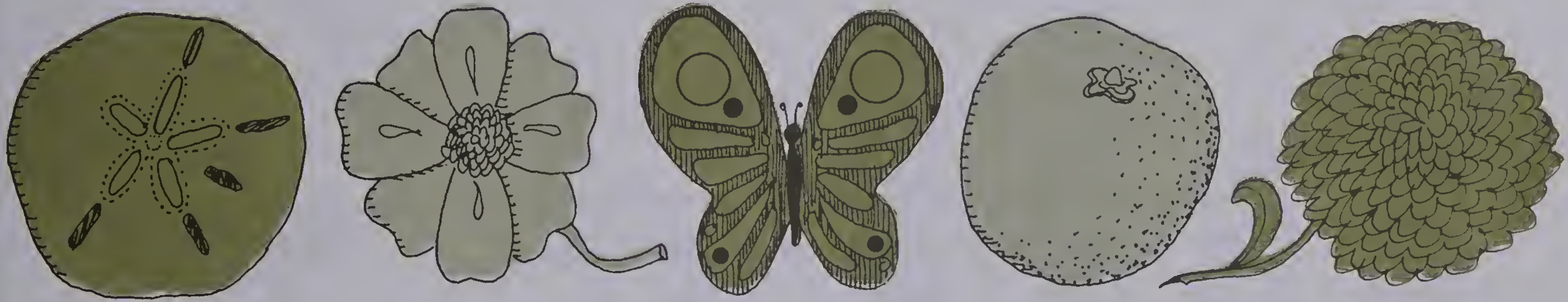




Choose something from your list.
Why do you think it needs
a circular shape?
Write about it.



Nature uses this shape too!

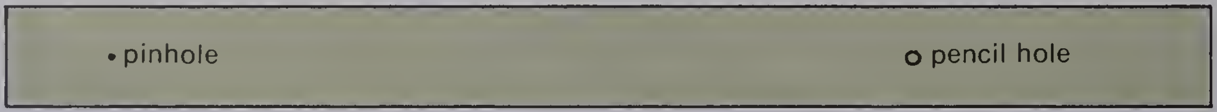


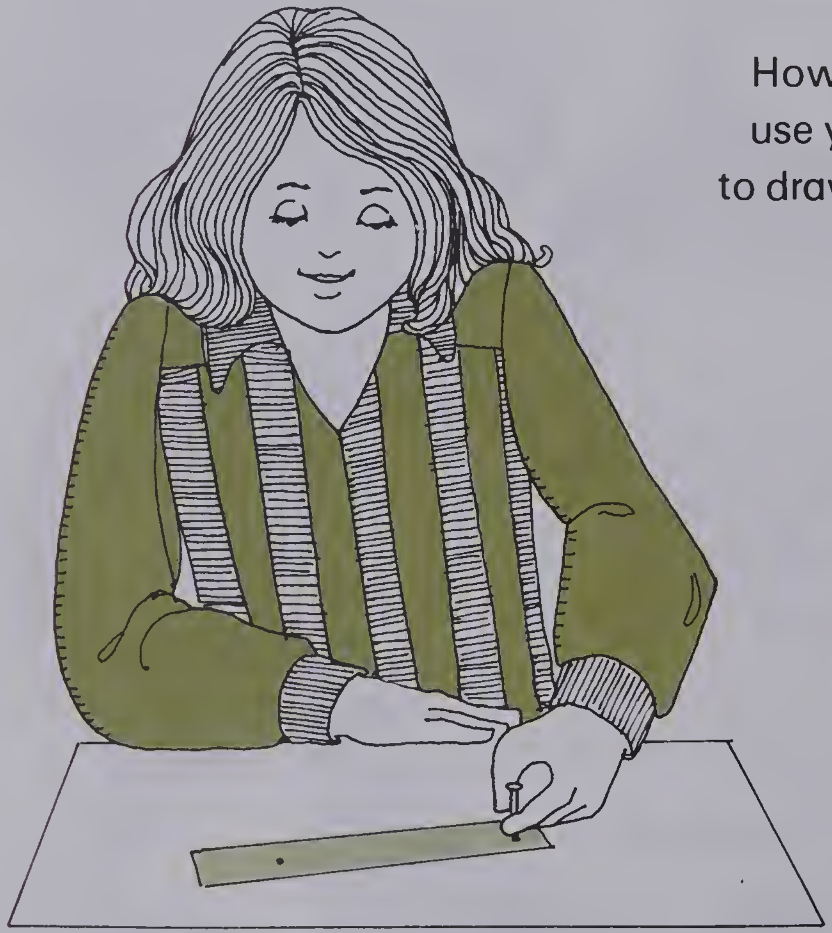
Make a list or find pictures that show
Nature's use of circular shapes.

Drawing Circles

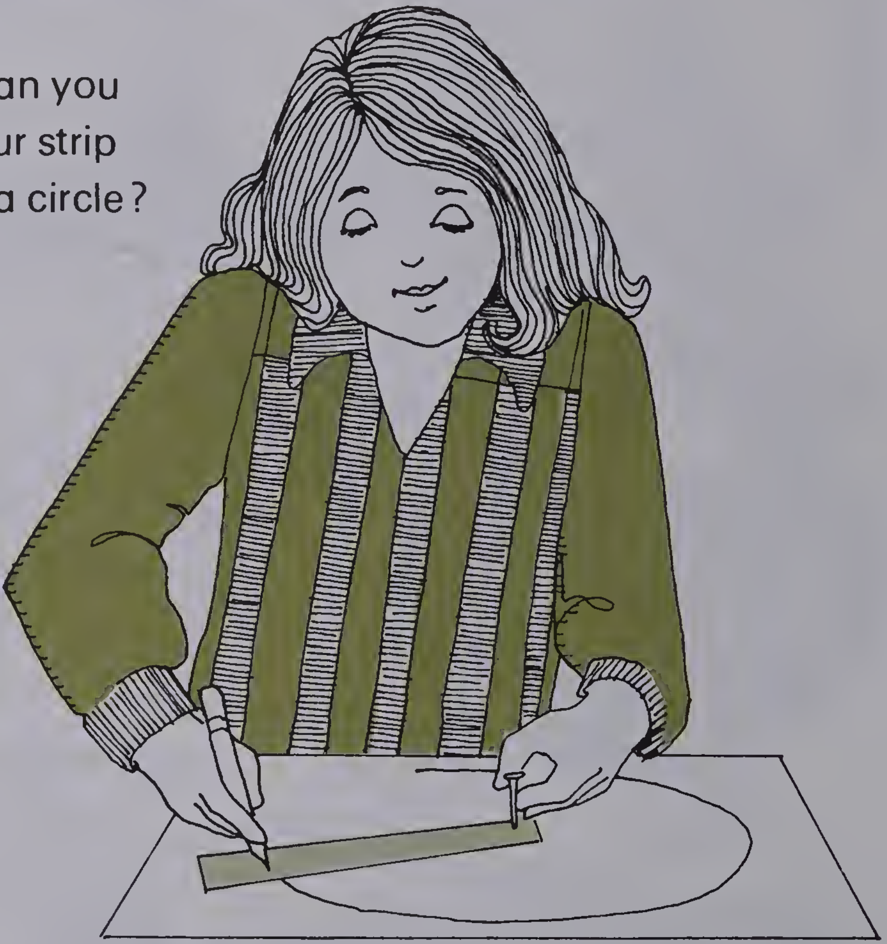
Cut a strip of cardboard about 1 cm wide and about 12 cm long.
About 1 cm from one end, make a pinhole.

Make another hole in the strip by pushing the point of your pencil through the cardboard.
Make this hole 8 cm from the pinhole.





How can you
use your strip
to draw a circle?



Cut out your circular shape.

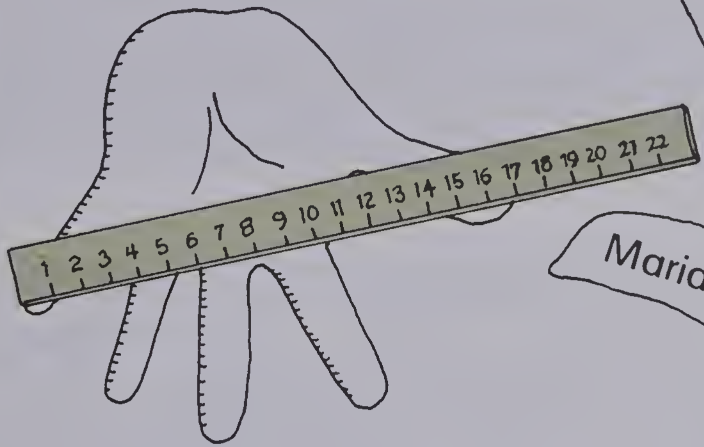
Make 2 more holes in your cardboard strip
and use it to draw other circles.

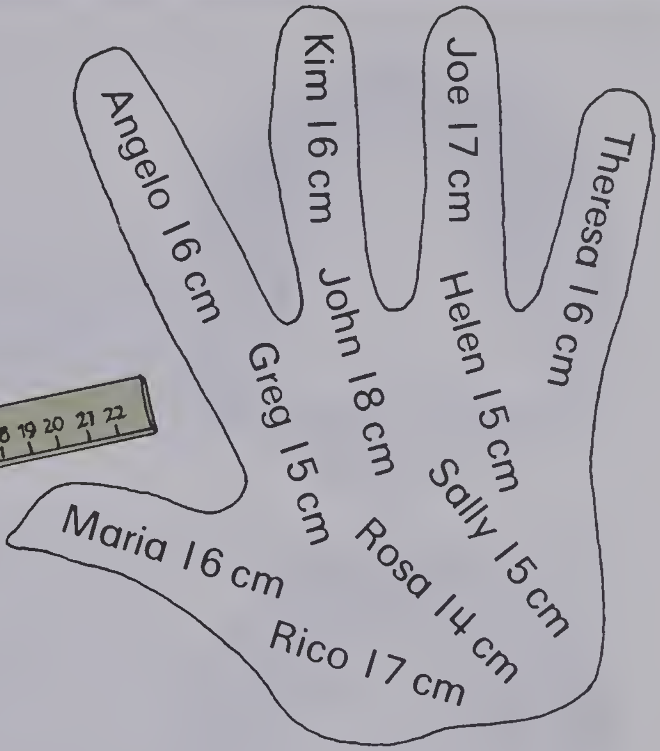
How can you fold a circular shape
to find its centre?

EXPLORE

Graphing

Collect information.

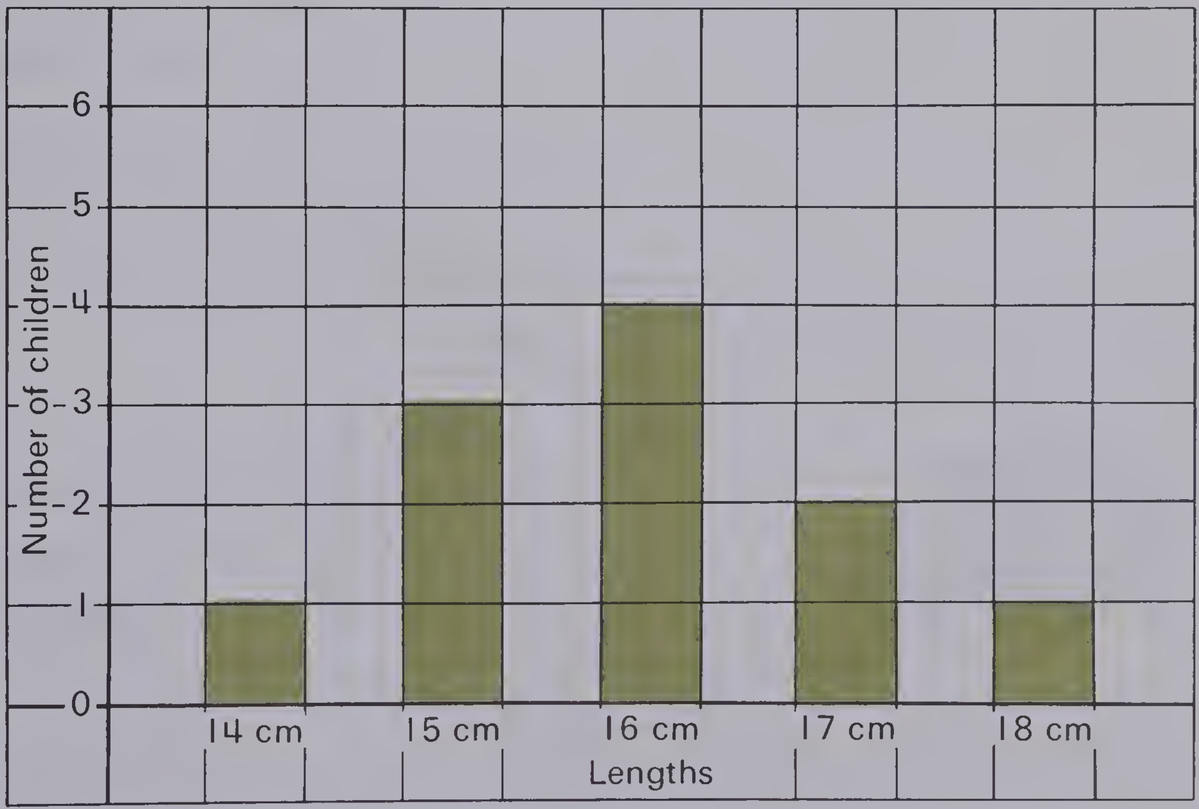

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

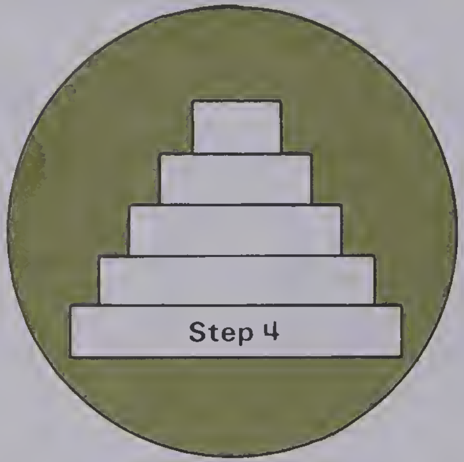

Angelo 16 cm
Kim 16 cm
Joe 17 cm
Theresa 16 cm
John 18 cm
Helen 15 cm
Greg 15 cm
Sally 15 cm
Rosa 14 cm
Maria 16 cm
Rico 17 cm

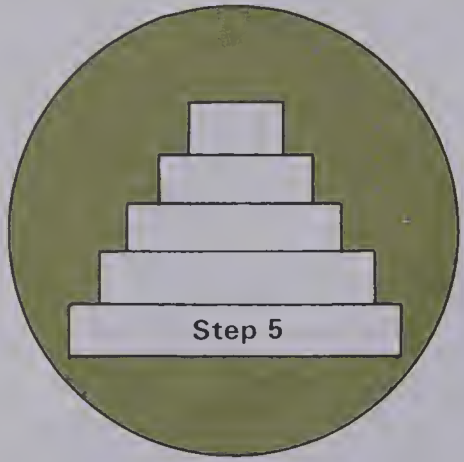
Sort information.

14 cm	15 cm	16 cm	17 cm	18 cm
1	3	4	2	1

Draw graph.







Name the graph.

Lengths of Hand Spans

EITHER

Ask someone questions about your graph.

1. How many children have a hand span of 16 cm long?
2. How many have a hand span 17 cm long?
3. How many students measured the length of their hand span?
4. If you had been included in the group, would one of the bars have been longer?

OR

Write about things you can discover by looking at a friend's graph.

Only 1 child had a hand span 14 cm long. 7 children had a hand span either 15 cm or 16 cm long. Twice as many children had 16 cm hand spans as had 17 cm hand spans. Altogether, 11 children measured their hand spans.

IN ACTION

1. Mario collected this information on pets belonging to children in his class.

Maria / dog
Joe / dog
Gino / cat
Grace / budgie
Tony / cat
Greg / horse
Michael / dog
Ann / dog
Helen / cat
Doris / dog
Don / mouse
Rita / snake
Joan / cat
Robin / goldfish
Mario / mouse

He sorted his information in a table.
Finish the table the way Mario might have done it.
What name might you give this graph if you drew it?

Dog	Cat	Horse				
5						

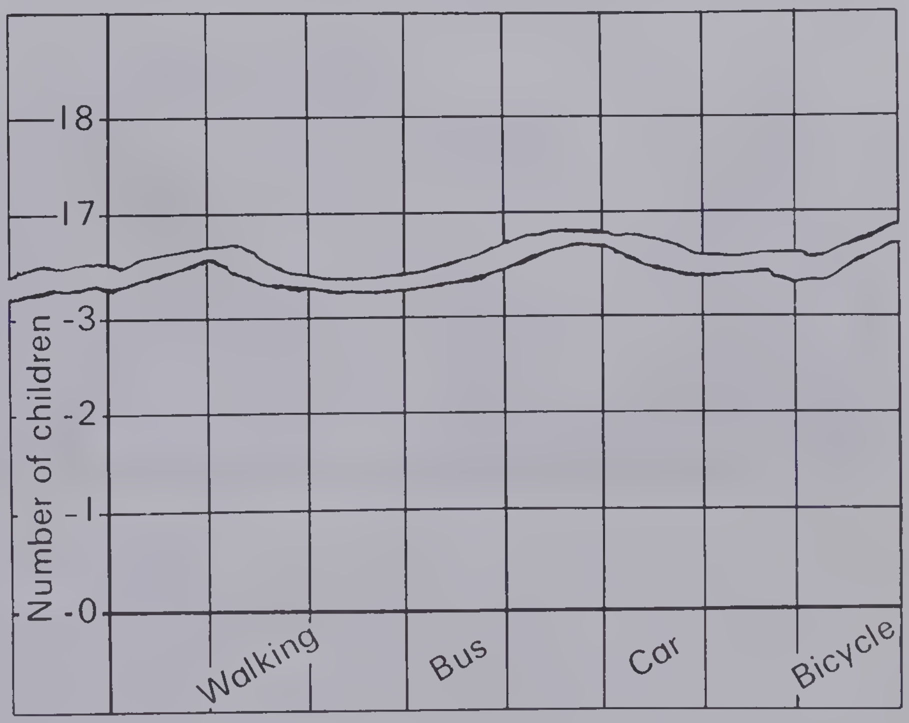
2. Use graph paper and this information to help you build a graph. It has been started for you.

3. Look at the graph you made for Question 2. Write about some things you can learn from the graph.

4. Collect information about the ways your classmates come to school. Make a table. Compare the information for your class with the information in Question 2.

Ways of Coming to School

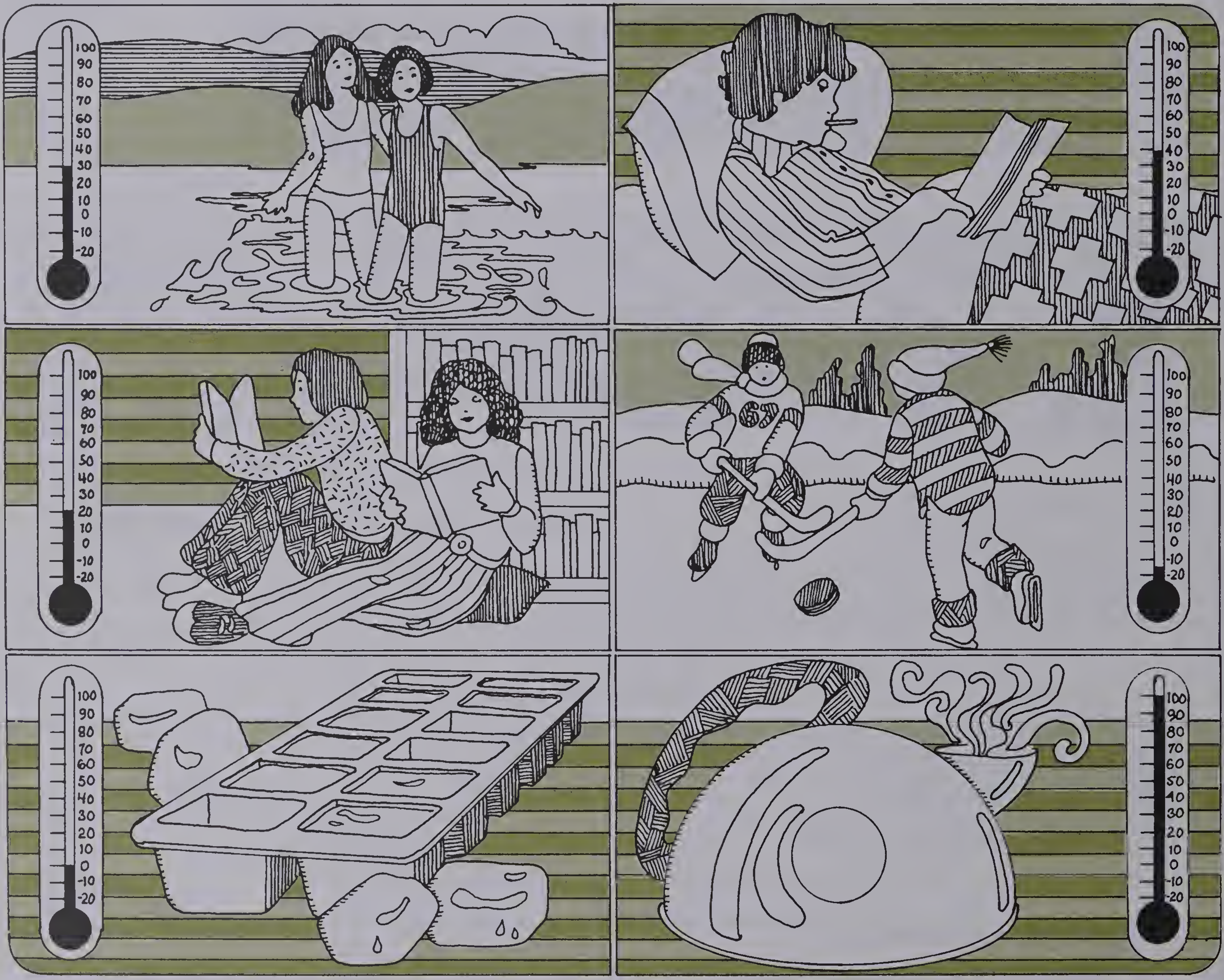
Walking	Bus	Car	Bicycle
16	3	5	8



EXPLORE

Temperature / Degrees Celsius °C

Look at each picture. Read each temperature.



100
90
80
70
60
50
40
30
20
10
0
-10
-20
100
90
80
70
60
50
40
30
20
10
0
-10
-20
100
90
80
70
60
50
40
30
20
10
0
-10
-20
67
100
90
80
70
60
50
40
30
20
10
0
-10
-20
100
90
80
70
60
50
40
30
20
10
0
-10
-20
100
90
80
70
60
50
40
30
20
10
0
-10
-20

What do you think
the outdoor temperature is today?
Check your estimate.

IN ACTION

1. Use a thermometer to find the temperature :

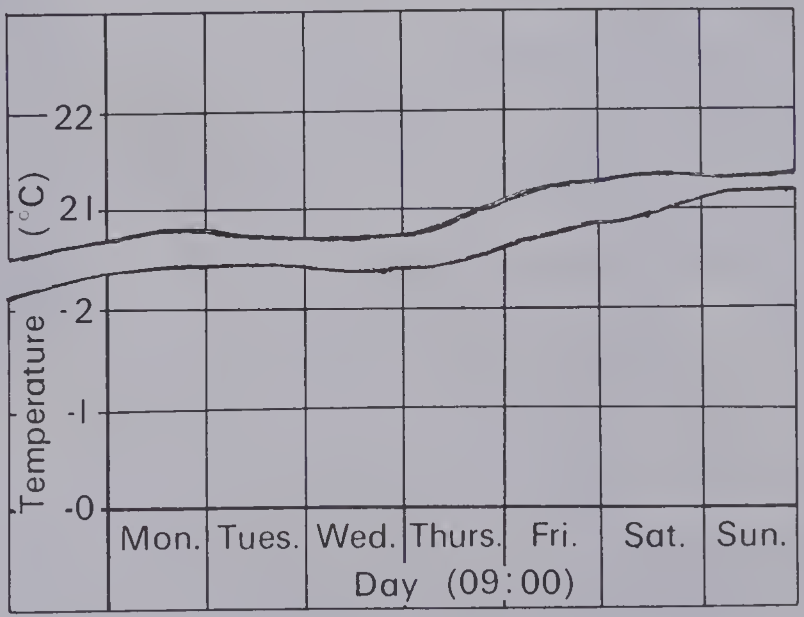
- a) inside your classroom
- b) in the basement of your school
- c) outdoors
- d) of a glass of cold water
- e) of water you could use to wash your face
- f) 10 cm from a 100 W (watt) bulb
- g) 20 cm from a 100 W bulb
- h) of a can of snow or ice cubes

2. These temperatures were recorded as the highs for April 22.

- a) Which city had the highest temperature?
- b) Which city had the lowest temperature?
- c) What is the difference between the temperatures in Halifax and Vancouver?
- d) Between which 2 cities is there the greatest difference in temperature?
- e) Between which 2 cities is there the least difference in temperature?

Dawson	9°C
Yellowknife	3°C
Vancouver	11°C
Edmonton	13°C
Regina	12°C
Winnipeg	7°C
Ottawa	12°C
Quebec	9°C
Fredericton	6°C
Halifax	5°C
Charlottetown	1°C
St. John's	3°C

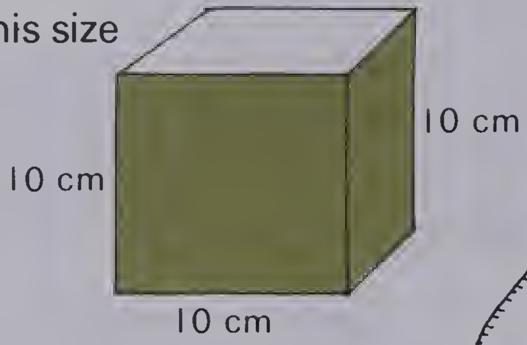
3. Each day at the same time, read and record the outside temperature. Use the information to make a graph. Name your graph.



EXPLORE

The Litre ℓ

The **litre** is a unit we use to measure **capacity.** A container this size would hold just 1 ℓ.


10 cm
10 cm
10 cm

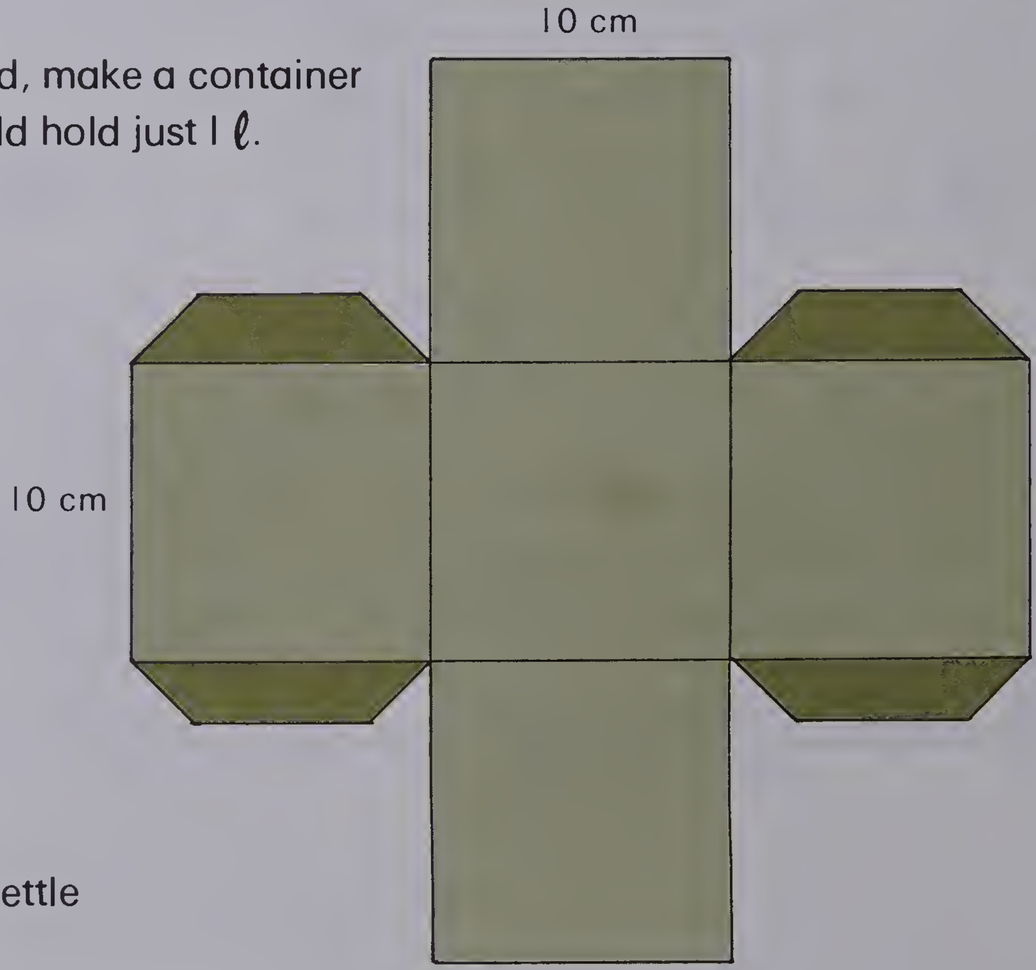
fabric softener
apple Cider
OIL
PAINT
milk
orange juice

Collect containers that you think hold about 1 ℓ.

Use a litre container to check your estimates.

IN ACTION

1. From cardboard, make a container that would hold just 1 ℓ.



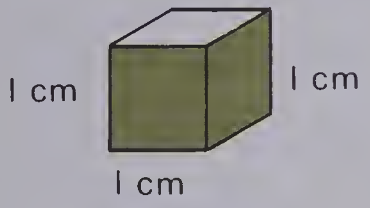
2. List 10 things which people buy by the litre. Record the list on your litre container.

3. Find a container that holds 1 ℓ that you can use at home. Estimate then measure the number of litres required to fill :
   a) a bucket
   b) a tea kettle
   c) a large mixing bowl
   d) a sink

The Millilitre ml

The **millilitre** is a unit we use to measure small capacities.

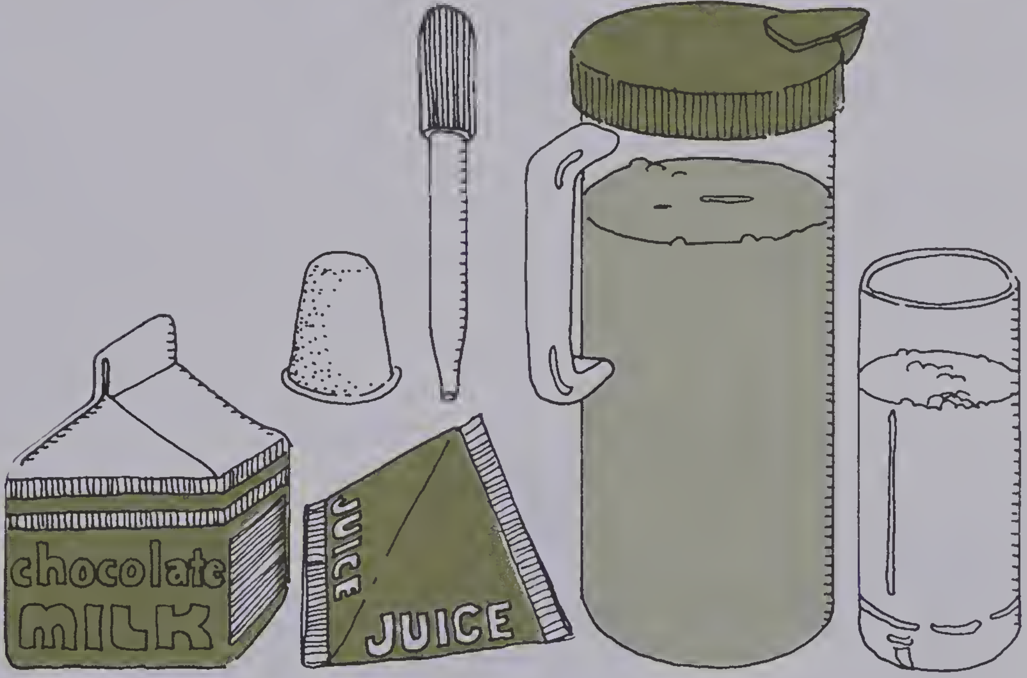
A container this size would hold just 1 ml.



About 20 drops make 1 ml.

A thimble holds about 2 ml.

A litre container holds 1000 ml.

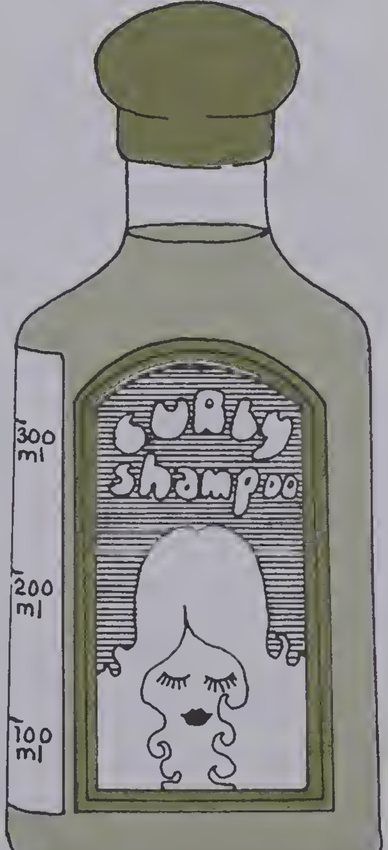

chocolate
MILK
JUICE
JUICE

IN ACTION

1. Make a list of 10 things people buy by the millilitre.

2. Bring a clear plastic bottle from home. Paste a strip of paper up the side. Use a container marked in millilitres to pour 100 ml of water into your bottle. Mark the height of the water. Pour in another 100 ml of water. Mark 200 ml on your paper. Continue until you have filled the bottle.

3. Estimate, then use your plastic bottle to find the number of millilitres contained in each of 3 different containers you collect.


300 ml
200 ml
100 ml
Curly
Shampoo

The Kilogram kg

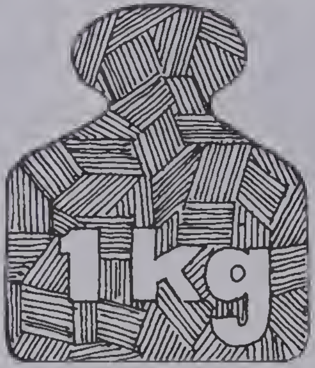
We can measure the **mass** of heavy objects in **kilograms**.

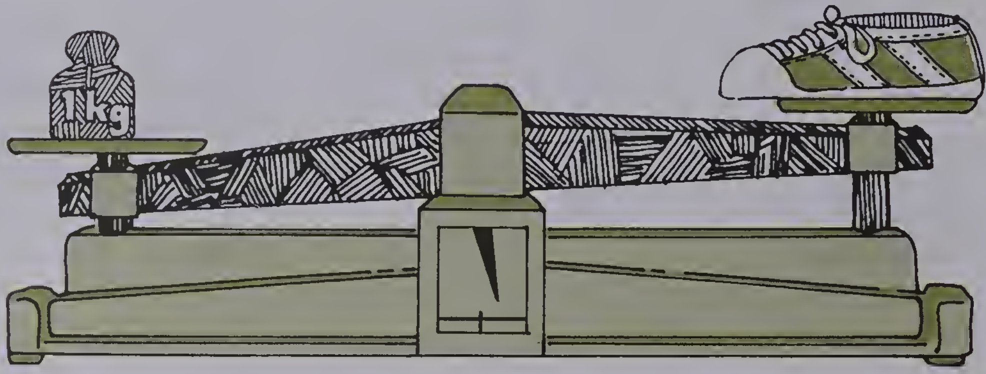
Try to get a good concept of 1 kg.

Hold a 1 kg mass in one hand and a shoe in your other hand. Which is heavier?

Use a balance to check your guess.

Hold a 1 kg mass in your hand. Move the mass to your other hand. Does it feel heavier in one hand?





IN ACTION

Work with a partner. Is each object in the chart heavier, lighter, or about the same mass as 1 kg? Make a guess about the first object, then check with a balance. Complete the chart in your notebook.

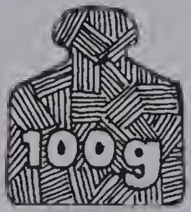
Object	Heavier than 1 kg	Lighter than 1 kg	Same as 1 kg	Check here if you guessed correctly
Dictionary				
Pair of shoes				
Box of chalk				
Telephone book				
1 ℓ of water				
Big lump of Plasticine				
Baseball				
Baseball bat				

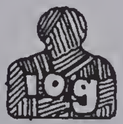
EXPLORE

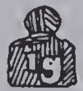
The Gram g

We can measure the mass of light objects in **grams**.

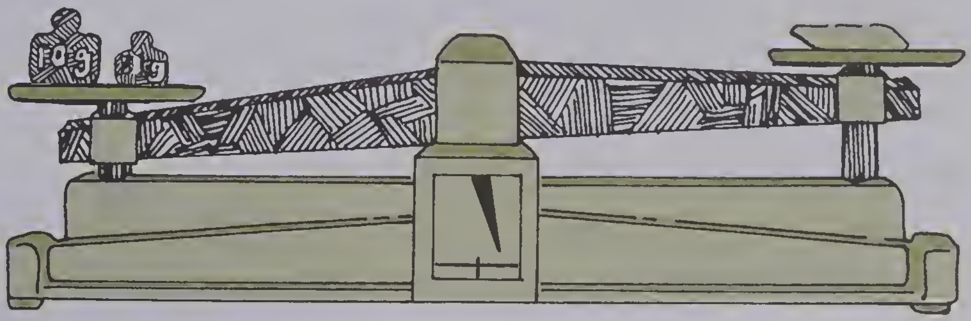
Put a pencil in one pan of a balance. Put some 10 g and 1 g masses in the other pan until you find a balance. What is the mass of the pencil?







Find the mass of your eraser.

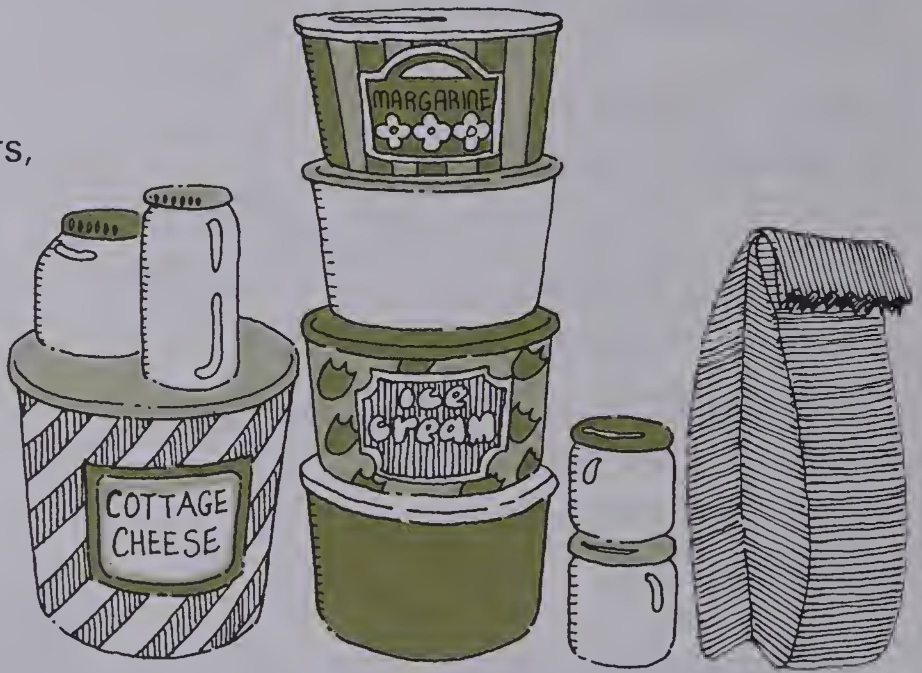


IN ACTION

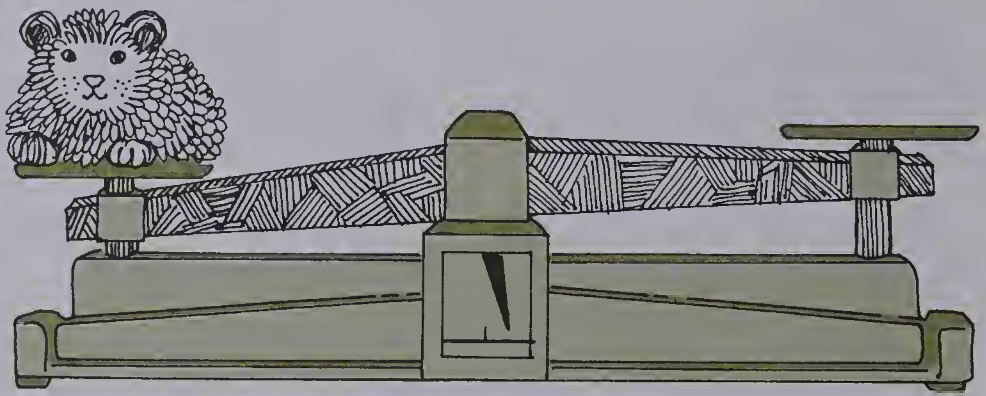
Work with a partner. Make a collection of the objects listed in the chart. Complete the chart in your notebook.

Object	Estimated mass (grams)	Measured mass (grams)
Ruler		
Workbook		
Scissors		
1 kg mass		
500 ml of water		
Chalkboard brush		
Apple		
Library book		
100 ml of water		
This textbook		

2. Your group can make its own set of masses. Bring to school some empty containers. Baby food bottles, cottage cheese containers, or plastic bags would do. To make your 100 g mass, put a 100 g mass on one pan of a balance and an empty container and lid on the other side. Fill the empty container with sand or small stones until the pans are balanced. Seal the container and label your mass. Make other masses in the same way.



3. Does your school have a pet? Find its mass. Use the masses you made.



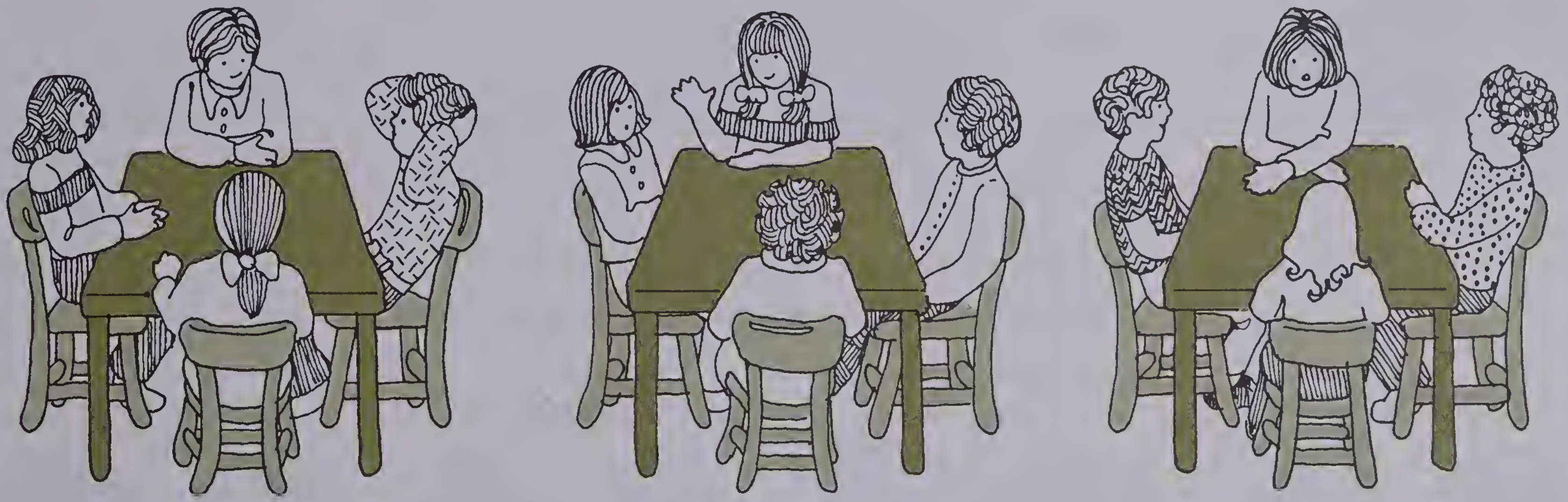
4. Use your masses to find the mass of a 1 ℓ container. Now fill the container with water. What is the total mass of the container and the water? What is the mass of just the water?

5. Copy and complete the chart in your notebook. Use the 1 ℓ container from Question 4.

Object	Estimated mass (nearest 100 g)	Measured mass (nearest 100 g)
1 ℓ cereal		
1 ℓ pebbles		
1 ℓ nails		
1 ℓ sand		
1 ℓ acorns		
1 ℓ marbles		

EXPLORE

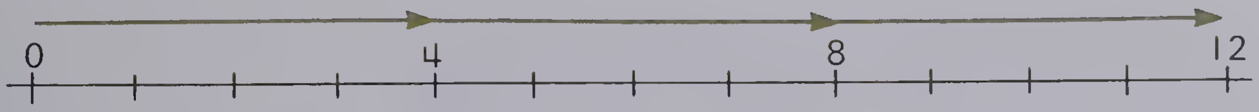
Thinking About Multiplication



There are 3 tables.
There are 4 children at each table.
We multiply to find the number of children.

Multiplication sentence
3 × 4 = 12

We can use a number line to show multiplication.



There are 3 sets, with 4 in each set.
3 × 4 = 12

An array shows multiplication.

× × × ×

× × × ×

× × × ×

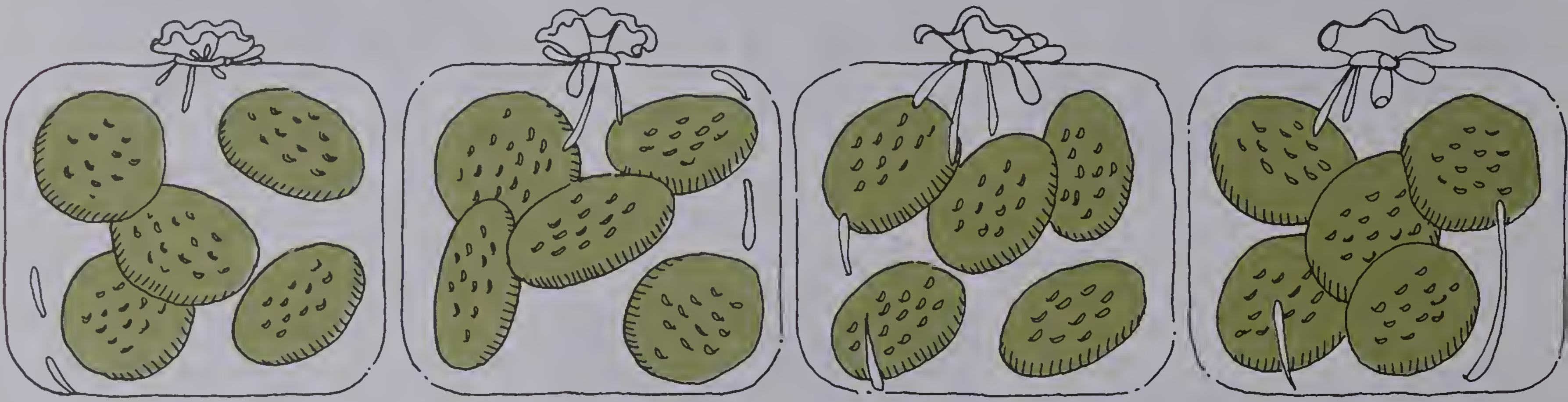
How many rows are there?
How many columns are there?
How many X's are there altogether?
Write the multiplication sentence.

IN ACTION

1. Draw a picture for each multiplication sentence.

a) 2 × 5 = 10 b) 4 × 2 = 8 c) 3 × 3 = 9 d) 4 × 4 = 16 e) 5 × 3 = 15

2. There are 4 bags. There are 5 cookies in each bag. Write a multiplication sentence to find the number of cookies.



3. Complete the chart for the arrays.

a)
× × × × ×
× × × × ×
× × × × ×

b)
× × × ×
× × × ×
× × × ×
× × × ×

c)
× × × × ×
× × × × ×
× × × × ×
× × × × ×
× × × × ×

Array	Number of rows	Number of columns	Multiplication sentence
a)			
b)			
c)			

4. Use number lines to show:
   - a) 3 sets, with 2 in each set
   - b) 4 sets, with 4 in each set

   Write a multiplication sentence for each part.

5. Write a multiplication sentence for each number pair.

a) (3,2) b) (4,2) c) (5,1)
d) (0,4) e) (4,5) f) (3,4)

EXPLORE

Multiplication I × I to 5 × 5

Try this plan for learning multiplication facts.
Copy and complete the chart.

×	1	2	3	4	5
1	1				
2	2	4			
3	3	6	9		
4	4	8	12	16	
5	5	10	15	20	25

Diagonals D C B A

centre diagonal

What did you discover?

IN ACTION

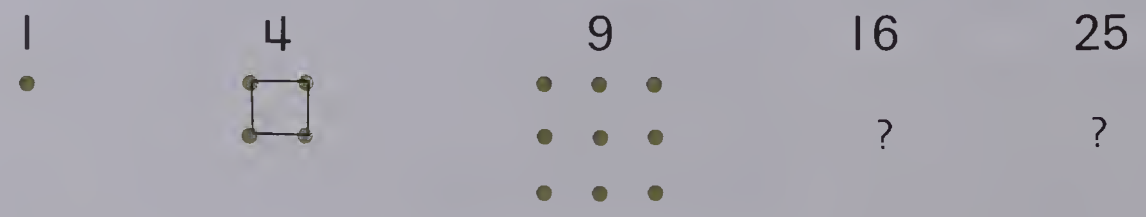
1. a) Copy and complete.
   b) How many facts do you really need to learn?

Facts below the centre diagonal	Facts above the centre diagonal
2 × 1 = ?	1 × 2 = 2
3 × 1 = ?	1 × 3 = ?
3 × 2 = 6	2 × 3 = ?
4 × 1 = ?	1 × 4 = ?
4 × 2 = ?	2 × 4 = ?
4 × 3 = ?	3 × 4 = ?
5 × 1 = ?	1 × 5 = ?
5 × 2 = ?	2 × 5 = ?
5 × 3 = ?	3 × 5 = ?
5 × 4 = ?	4 × 5 = ?

2. Let's learn the multiplication facts a diagonal at a time.
What patterns can you find?

Diagonal	Facts	Number of facts
Centre diagonal 1 4 9 16 25	1 × 1 = ? 2 × 2 = ? 3 × 3 = ? 4 × 4 = ? 5 × 5 = ?	5
Diagonal A 2 6 12 20	2 × 1 = 2 3 × 2 = 6 4 × 3 = ? 5 × 4 = ?	?
Diagonal B 3 8 15	3 × 1 = ? 4 × 2 = ? 5 × 3 = ?	?
Diagonal C 4 10	4 × 1 = ? 5 × 2 = ?	?
Diagonal D 5	5 × 1 = ?	?

3. The centre diagonal numbers of the chart are called **square numbers.**
Complete the pictures to see why.



Is the name a good one?

EXPLORE

Multiplication 1 × 1 to 7 × 7

Why do you need to learn only the centre diagonal facts and the ones below the centre diagonal?

Remember.
4 × 3 = 3 × 4
5 × 2 = 2 × 5
6 × 1 = 1 × 6
and so on

×	1	2	3	4	5	6	7
1	1					6	
2	2	4			10		
3	3	6	9	12			
4	4	8	12	16			
5	5	10	15	20	25		
6	6	12	18	24	30	36	
7	7	14	21	28	35	42	49

Diagonals F E D C B A

centre diagonal

IN ACTION

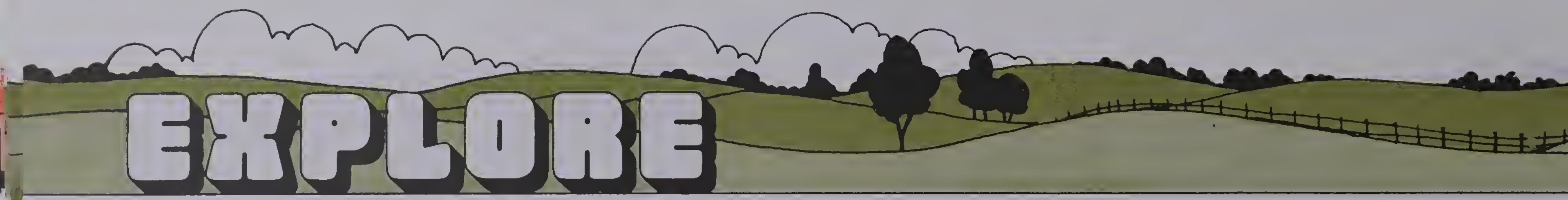
1. Record the multiplication facts you need to know. Complete 1 diagonal at a time. Use the plan shown in Question 2 on page 58.

2. How many facts do you need to learn for the chart 1 × 1 to 7 × 7?

3. Draw pictures for the square numbers 36 and 49.

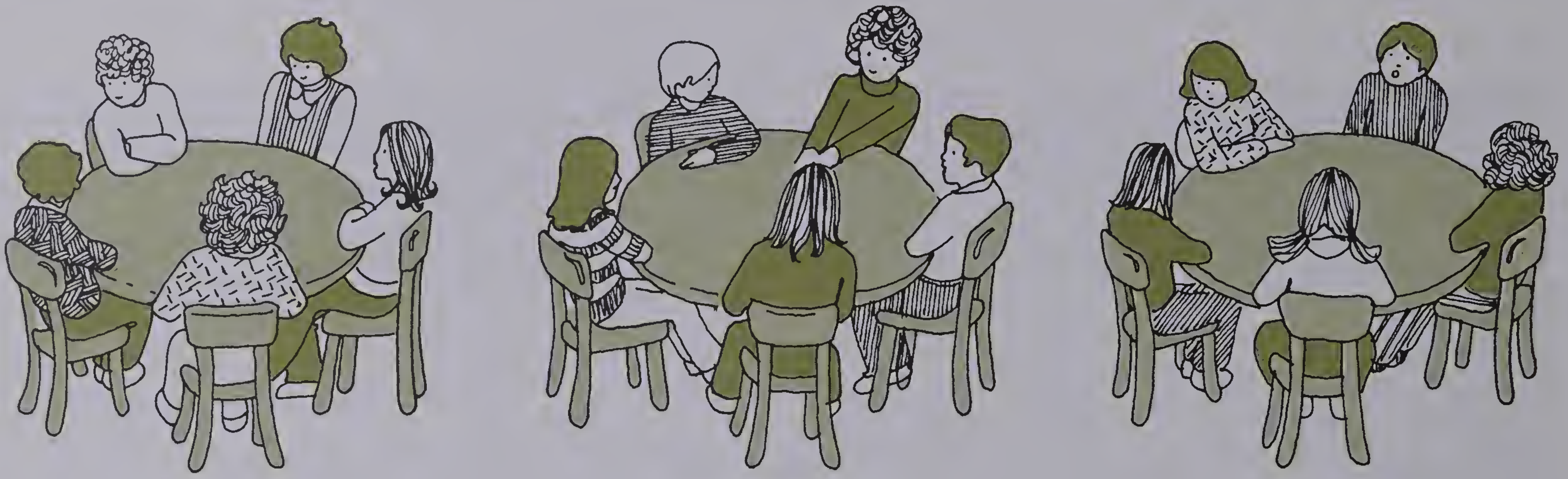
4. Complete.

a) 3 × 5 = ? b) 4 × 7 = ? c) 2 × 6 = ? d) 5 × 6 = ? e) 3 × 7 = ?
f) 2 × 5 = ? g) 4 × 6 = ? h) 5 × 7 = ? i) 3 × 4 = ? j) 6 × 7 = ?



EXPLORE

Thinking About Division



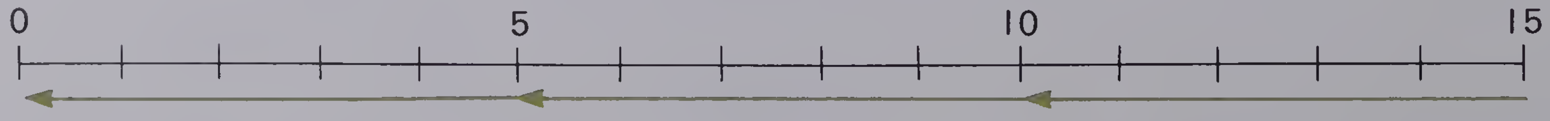
There are 3 tables.
There are 15 children,
with the same number at each table.
We divide to find the number of children at each table.

Division sentence
15 ÷ 3 = 5

There are 15 X's in the array.
5 columns
X X X X X
X X X X X 3 rows
X X X X X

Division tells the number of rows,
15 ÷ 5 = 3
or division tells the number of columns.
15 ÷ 3 = 5

We can think of division as finding how many times
one number is contained in another number.

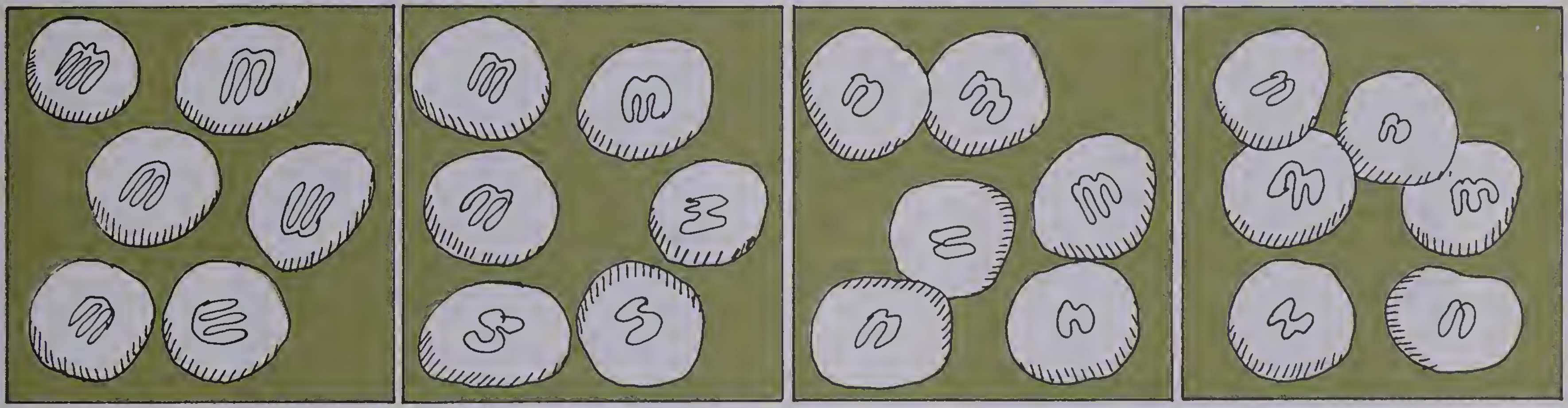


15 ÷ 5 tells the number of fives in 15.
Write the division sentence.

IN ACTION

1. Draw a picture for each division sentence.

a) 8 ÷ 2 = 4 b) 9 ÷ 3 = 3 c) 18 ÷ 6 = 3 d) 24 ÷ 4 = 6 e) 35 ÷ 7 = 5



2. There are 24 cookies, with the same number in each box.
How many cookies are in each box?
Write a division sentence.

3. Write 2 division sentences for each array.

a)
× × × × ×
× × × × ×
× × × × ×
× × × × ×

b)
× × × × × ×
× × × × × ×

c)
× × ×
× × ×
× × ×
× × ×
× × ×
× × ×

d)
× × × × ×

4. Use number lines to find how many
a) fours in 24 b) fives in 30
c) sixes in 24 d) ones in 7.
Write a division sentence for each part.

5. Write a division sentence for each number pair.
a) (10,2) b) (15,3) c) (8,4) d) (6,2)
e) (5,1) f) (12,4) g) (16,4) h) (20,5)
i) (25,5) j) (30,5) k) (20,4) l) (18,3)

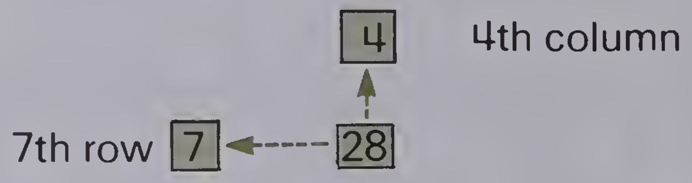
EXPLORE

Division 1 ÷ 1 to 49 ÷ 7

Use the multiplication chart for division.

Find 28 in the chart. $\boxed{28}$

Since 7 × 4 = 28



then 28 ÷ 4 = 7 and 28 ÷ 7 = 4

We also show division in this way :

$$\begin{array}{r} 7 \\ 4\overline{)\,28} \end{array} \quad \text{and} \quad \begin{array}{r} 4 \\ 7\overline{)\,28} \end{array}$$

IN ACTION

1. If you know the multiplication facts, you know the division facts.

Complete the chart for each diagonal number.

Diagonal	Diagonal number	Multiplication sentence	Division sentences
A	2	2 × 1 = 2	2 ÷ 1 = 2 2 ÷ 2 = 1
A	6		

2. Which diagonal numbers have only 1 division sentence?

3. Write 2 other sentences. Check your chart if you need help.

a) 2 × 7 = 14
b) 5 × 4 = 20
c) 24 ÷ 4 = 6
d) 18 ÷ 3 = 6
e) 3 × 7 = 21
f) 5 × 6 = 30
g) 35 ÷ 7 = 5
h) 42 ÷ 7 = 6

4. Learn the multiplication and division facts well.
When you are given 2 numbers and an operation,
you should think the answer.
Record only the answers for these number pairs.

a) Multiplication

Number pair	Answer
(6,4)	
(5,3)	
(4,4)	
(6,2)	
(5,2)	
(2,7)	
(4,2)	
(7,4)	
(6,0)	
(2,6)	

b) Division

Number pair	Answer
(35,7)	
(20,4)	
(18,6)	
(49,7)	
(25,5)	
(16,4)	
(42,6)	
(30,5)	
(24,4)	
(36,6)	

5. Solve.

a) $4 \times n = 20$ 4 times a number is 20.
$n = ?$ What is the number?

b) $5 \times n = 35$ c) $6 \times k = 30$ d) $2 \times p = 8$ e) $3 \times m = 15$
f) $2 \times y = 10$ g) $7 \times g = 35$ h) $7 \times c = 0$ i) $7 \times w = 42$
j) $3 \times v = 21$ k) $4 \times n = 24$ l) $5 \times p = 25$ m) $6 \times k = 36$

6. Multiply.

$\begin{array}{r} 7 \\ \underline{4} \end{array}$ Think 28 $\begin{array}{r} 6 \\ \underline{5} \end{array}$ $\begin{array}{r} 3 \\ \underline{2} \end{array}$ $\begin{array}{r} 6 \\ \underline{1} \end{array}$ $\begin{array}{r} 7 \\ \underline{1} \end{array}$ $\begin{array}{r} 4 \\ \underline{5} \end{array}$ $\begin{array}{r} 2 \\ \underline{7} \end{array}$ $\begin{array}{r} 7 \\ \underline{7} \end{array}$ $\begin{array}{r} 2 \\ \underline{5} \end{array}$

7. Divide.

$\begin{array}{r} 7 \\ 3\overline{)21} \end{array}$ $6\overline{)30}$ $7\overline{)28}$ $4\overline{)28}$ $5\overline{)20}$ $6\overline{)12}$ $5\overline{)15}$ $7\overline{)21}$

Building a Chart to 10 × 10 = 100

Complete a chart to 10 × 10 = 100.
Use the 10 by 10 **array** to help you.

Suppose you don't know
the answer to 9 × 7.

9 × 7 = ?

You know
5 × 7 = 35

You know
4 × 7 = 28

	1	2	3	4	5	6	7	8	9	10
1	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X	X
3	X	X	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X
9	X	X	X	X	X	X	X	X	X	X
10	X	X	X	X	X	X	X	X	X	X

$$\begin{aligned} 9 \times 7 &= (5 \times 7) + (4 \times 7) \\ &= 35 + 28 \\ &= 63 \end{aligned}$$

Use the array to complete these questions.

a) $8 \times 6 = (5 \times 6) + (? \times 6)$
$= 30 + ?$
$= ?$

b) $9 \times 8 = (? \times 8) + (? \times 8)$
$= ? + ?$
$= ?$

Here is a multiplication chart
to 10 × 10 = 100, 100 ÷ 10 = 10.

How many
diagonals
are there?
How many
multiplication
facts
do you need
to know
from
1 × 1 to 10 × 10?

10 columns

10 rows

×	1	2	3	4	5	6	7	8	9	10
1	1									
2	2	4								
3	3	6	9							
4	4	8	12	16						
5	5	10	15	20	25					
6	6	12	18	24	30	36				
7	7	14	21	28	35	42	49			
8	8	16	24	32	40	48	56	64		
9	9	18	27	36	45	54	63	72	81	
10	10	20	30	40	50	60	70	80	90	100
Diagonals	I	H	G	F	E	D	C	B	A	

centre diagonal

If you know a multiplication fact,
then you know 2 division facts.
For 8 × 9 = 72,
you know 72 ÷ 9 = 8
and 72 ÷ 8 = 9.

Write the division facts.

a) 9 × 4 = 36 b) 8 × 5 = 40 c) 8 × 7 = 56 d) 9 × 10 = 90 e) 6 × 8 = 48
f) 7 × 9 = 63 g) 9 × 5 = 45 h) 6 × 9 = 54 i) 10 × 8 = 80 j) 8 × 8 = 64

Write a multiplication fact and another division fact.

a) 30 ÷ 3 = 10 b) 54 ÷ 6 = 9 c) 80 ÷ 10 = 8 d) 36 ÷ 4 = 9 e) 21 ÷ 3 = 7
f) 60 ÷ 10 = 6 g) 30 ÷ 6 = 5 h) 32 ÷ 8 = 4 i) 27 ÷ 3 = 9 j) 45 ÷ 9 = 5

IN ACTION

1. Record the answers only.

a)

Multiplication	
Number pair	Answer
(8,3)	
(6,10)	
(5,9)	
(9,6)	
(8,0)	
(9,3)	
(8,6)	
(9,8)	

b)

Division	
Number pair	Answer
(24,8)	
(70,7)	
(27,9)	
(50,10)	
(81,9)	
(18,3)	
(14,7)	
(40,5)	

2. Solve.

a) $6 \times p = 54$ b) $4 \times a = 20$ c) $7 \times k = 63$ d) $9 \times m = 81$ e) $8 \times n = 32$

f) $7 \times c = 49$ g) $6 \times d = 42$ h) $8 \times y = 72$ i) $6 \times k = 48$ j) $7 \times p = 56$

3. Solve.

a) $35 \div n = 7$ 35 divided by a number is 7.
$n = ?$ What is the number?

b) $24 \div p = 4$ c) $49 \div k = 7$ d) $63 \div n = 9$ e) $72 \div g = 8$ f) $30 \div h = 5$

g) $54 \div d = 9$ h) $42 \div e = 6$ i) $56 \div k = 7$ j) $32 \div n = 4$ k) $40 \div a = 4$

4. Copy and complete.

a)

a	$3 \times a$
2	6
3	9
4	?
6	?

b)

k	$7 \times k$
3	?
5	?
4	?
10	70

c)

n	$5 \times n$
1	?
3	?
5	?
?	30

d)

p	$8 \times p$
0	0
4	?
6	?
?	64

Retrace Your Steps

1. Write 2 division sentences for each answer.
   a) 2 b) 3 c) 6 d) 4 e) 5 f) 8 g) 10
2. Recall the facts from 1×0 to 10×10 this way.

Method — **Do you know these facts?**

(1) You know that any number times 0 is 0.
$7 \times 0 = 0$ ✓

(2) You know that any number times 1 is the number.
$8 \times 1 = 8$ ✓

(3) You know that any number times 10 is the number with a 0 after it.
$7 \times 10 = 70$, $8 \times 10 = ?$, $9 \times 10 = ?$ ✓

(4) Any number times 2 doubles the number.
$2 \times 2 = 4$, $3 \times 2 = 6$ to $10 \times 2 = 20$
Do you know this list? ?

(5) The square numbers are on the centre diagonal.
Do you know $3 \times 3 = 9$ to $9 \times 9 = 81$? ?
$1 \times 1 = 1$, $2 \times 2 = 4$, and $10 \times 10 = 100$ are in (2), (3) and (4).

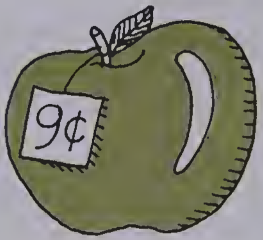
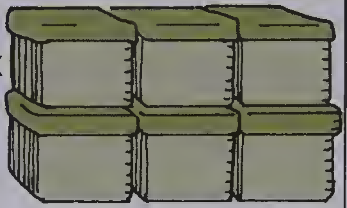
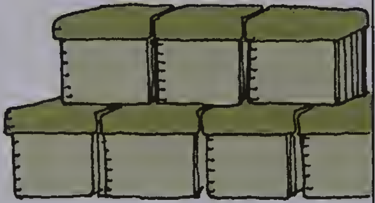
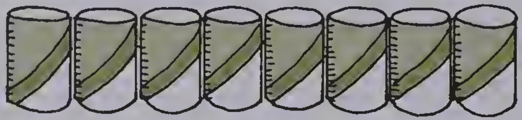
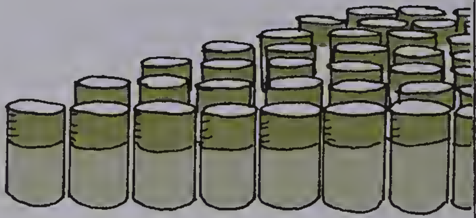
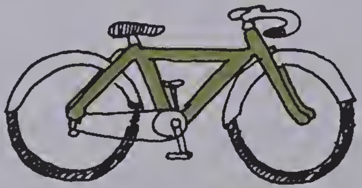
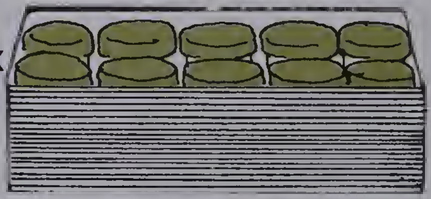
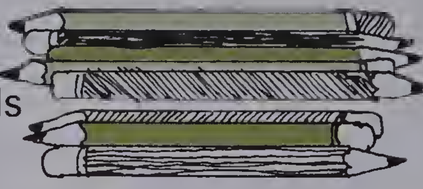
(6) Remember the "either-order rule", for example
$7 \times 8 = 8 \times 7$

Now here are the other facts.	Number of facts to learn
4×3, 5×3, 6×3, 7×3, 8×3, 9×3	6
5×4, 6×4, 7×4, 8×4, 9×4	5
6×5, 7×5, 8×5, 9×5	4
7×6, 8×6, 9×6	3
8×7, 9×7	2
9×8	1
	21 in all

3. For each of the 21 multiplication facts,
   learn the division facts:
   $12 \div 4 = 3$, $12 \div 3 = 4$ to $72 \div 9 = 8$, $72 \div 8 = 9$

EXPLORE

Short Story Problems

To answer these problems, think about • a number of rows • a number of columns • How many altogether?	To answer these problems, think about • an array • a number of columns • How many rows?
1. 7 apples 9¢ each What is the total cost? 	2. 72¢ for oranges 8¢ each How many oranges can you buy?
3. 6 boxes 8 packages in each box How many packages are there altogether? 	4. 56 packages 7 boxes How many packages are in each box? 
5. 8 tins in a row 4 rows How many tins are there altogether? 	6. 42 tins 7 rows How many tins are in a row? 
7. 8 bicycles in a rack 9 racks How many bicycles are in the racks? 	8. 90 bicycles 10 racks How many bicycles are in each rack?
9. 10 bottles of paint in a box 6 boxes How many bottles of paint are there?	10. 50 bottles of paint 10 bottles in a box How many boxes are there? 
11. 8 crayons in a box 3 boxes How many crayons are there altogether?	12. 36 pencils 4 boxes How many pencils go in each box? 

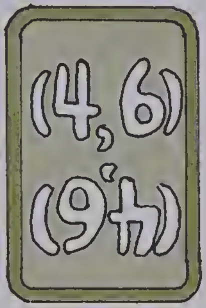
Multi-Pairs (4 players)

Make a deck of 20 number pair cards.
Use these number pairs :
(4,6), (5,5), (7,4), (6,5), (8,4)

(7,5), (6,6), (6,7), (5,9), (6,8)

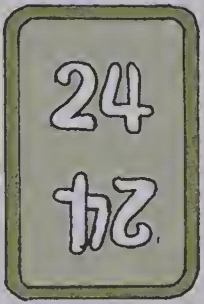
(7,7), (6,9), (7,8), (9,7), (8,8)

(8,9), (8,10), (9,9), (10,9), (10,10)



Make a deck of 20 answer cards.
Use these answers :
24, 25, 28, 30, 32, 35, 36, 42, 45, 48

49, 54, 56, 63, 64, 72, 80, 81, 90, 100



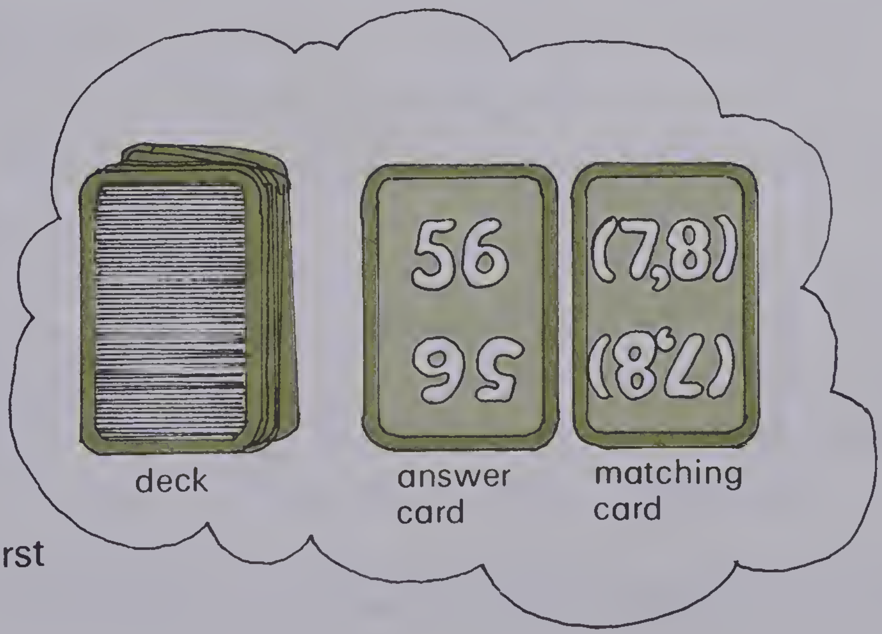
Deal 5 number pair cards to each player.
Place the answer cards in a pile, face down.

The first player turns up the top answer card. If she can match one of her number pair cards with the answer card, she places it on top of the answer card.

The second player turns up the next answer card and tries to match it.

If the first player cannot match the answer card, the next player has a chance.

The player who plays all his cards first is the winner.



EXPLORE

Multiply by 10, Divide by 10 / Patterns

Complete the pattern.

10 , 20 , 30 , to 100
1 × 10 2 × 10 3 × 10 10 × 10

Use the same pattern to multiply larger numbers by 10.
Complete the pattern.
11 × 10 = 110, 12 × 10 = 120, to 20 × 10 = 200

Use the same pattern to divide by 10.
Since 8 × 10 = 80, then 80 ÷ 10 = 8

Complete the pattern.
10 ÷ 10 = 1, 20 ÷ 10 = 2, 30 ÷ 10 = 3, to 200 ÷ 10 = 20

IN ACTION

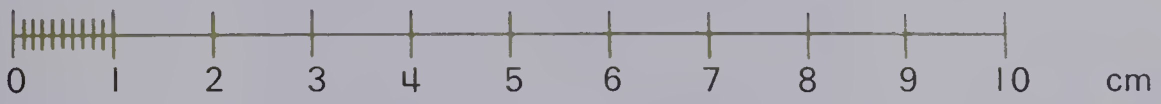
1. Complete the patterns.
   a) 11 × 10 = 110, 21 × 10 = 210, 31 × 10 = ?, to 91 × 10 = 910
   b) 7 × 10 = 70, 17 × 10 = ?, 27 × 10 = 270, to 97 × 10 = ?
   c) 14 × 10 = 140, 24 × 10 = 240, 34 × 10 = ?, to 94 × 10 = ?
   d) 8 × 10 = ?, 18 × 10 = ?, 28 × 10 = 280, to 98 × 10 = ?

2. Make up and complete 3 patterns like those in Question 1.

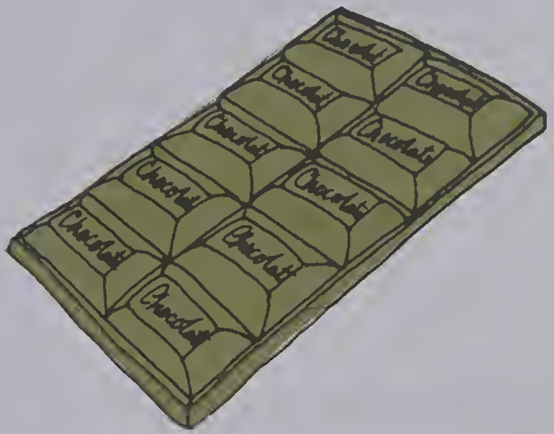
3. Complete the patterns.
   a) 900 ÷ 10 = 90, 800 ÷ 10 = 80, 700 ÷ 10 = ?, to 100 ÷ 10 = ?
   b) 970 ÷ 10 = 97, 870 ÷ 10 = ?, 770 ÷ 10 = 77, to 170 ÷ 10 = ?
   c) 990 ÷ 10 = ?, 890 ÷ 10 = 89, 790 ÷ 10 = ?, to 190 ÷ 10 = ?
   d) 930 ÷ 10 = 93, 830 ÷ 10 = ?, 730 ÷ 10 = 73, to 130 ÷ 10 = ?

4. Make up and complete 3 patterns like those in Question 3.

5. Imagine that each centimetre is divided into 10 equal parts.
How many parts are in
a) 3 cm b) 6 cm c) 9 cm d) 7 cm e) 4 cm f) 8 cm g) 2 cm?



6. Each chocolate bar has 10 sections.
How many sections have
a) 4 bars b) 5 bars c) 12 bars d) 24 bars
e) 36 bars f) 75 bars g) 80 bars h) 100 bars?



7. Multiply the first number by 10
to find the second number
in each pair.

a) (2, 20)
(12, 120)
(22, 220)
(32, ?)
(42, ?)

b) (3, 30)
(13, ?)
(23, ?)
(33, ?)
(43, ?)

c) (4, ?)
(14, ?)
(34, ?)
(54, ?)
(94, ?)

d) (6, ?)
(16, ?)
(46, ?)
(66, ?)
(86, ?)

e) (1, ?)
(11, ?)
(21, ?)
(41, ?)
(71, ?)

8. Multiply the first number by 10
to find the second number in each pair.
a) (7, ?) b) (12, ?) c) (19, ?) d) (27, ?) e) (38, ?)
f) (49, ?) g) (73, ?) h) (81, ?) i) (88, ?) j) (94, ?)

9. How many pennies can you exchange for
a) 1 dime b) 3 dimes c) 5 dimes d) 7 dimes e) 9 dimes f) 10 dimes?

10. How many dimes can you exchange for
a) 20 pennies b) 40 pennies c) 60 pennies d) 80 pennies e) 100 pennies?

11. How many dollars can you exchange for
a) 20 dimes b) 30 dimes c) 70 dimes d) 90 dimes e) 10 dimes f) 100 dimes?

12. Each carton holds 10 tins.
How many cartons are needed to hold
a) 70 tins b) 90 tins c) 30 tins d) 50 tins e) 40 tins f) 100 tins?

13. Divide the first number by 10
to find the second number in each pair.

a)	b)	c)	d)	e)
(30, 3)	(100, 10)	(10, ?)	(50, ?)	(10, ?)
(40, 4)	(110, ?)	(110, ?)	(150, ?)	(100, ?)
(50, 5)	(120, ?)	(210, 21)	(250, ?)	(1000, ?)
(60, ?)	(130, ?)	(310, ?)	(350, ?)	(20, ?)
(70, ?)	(140, ?)	(410, ?)	(450, ?)	(200, ?)

14. Divide the first number by 10
to find the second number in each pair.
a) (80, ?) b) (160, ?) c) (330, ?) d) (280, ?) e) (410, ?)
f) (570, ?) g) (630, ?) h) (780, ?) i) (840, ?) j) (990, ?)

15. If $37 \times 10 = 370$, then $370 \div 10 = ?$
Write 4 other "if, then" sentences
showing multiplication and division by 10.

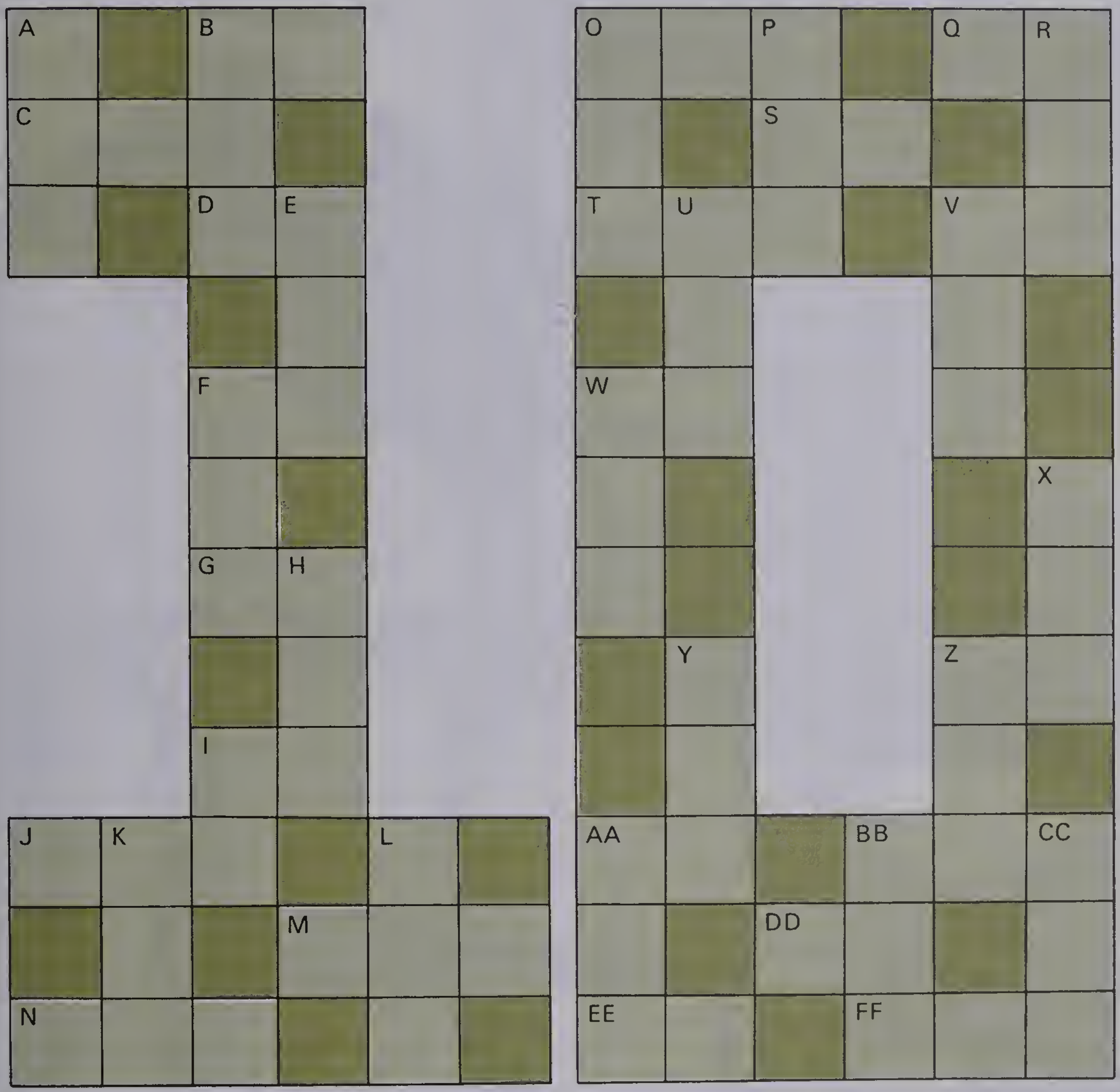
16. If 10 times a number is 120,
what is the number?

17. Solve.
a) $10 \times k = 140$, $k = ?$ b) $10 \times p = 230$, $p = ?$ c) $10 \times n = 480$, $n = ?$ d) $10 \times y = 900$, $y = ?$

18. If a number divided by 10 is 80,
what is the number?

10, The Magic Cross-Number Puzzle

Paper clip tracing paper over this page to complete the puzzle.



Down

A 43 × 10
B 7 hundreds, 0 tens, and 8
E 15 × 10
F 600 + 90 + 7
H 29 × 10
I 400 ÷ 10
K 35 × 10
L 16 × 10
O 5 hundreds, 2 tens, and 3
P 99 × 10
R 51 × 10
U 49 × 10
V 86 × 10
W 21 × 10
X 73 × 10
Y 46 × 10
Z 25 × 10
AA 5 hundreds, 8 tens, and 1
BB 400 + 0 + 1
CC 79 × 10

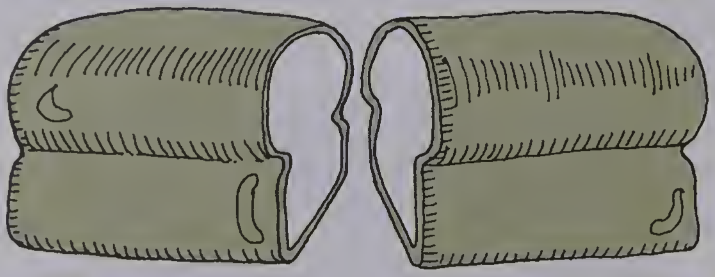
Across

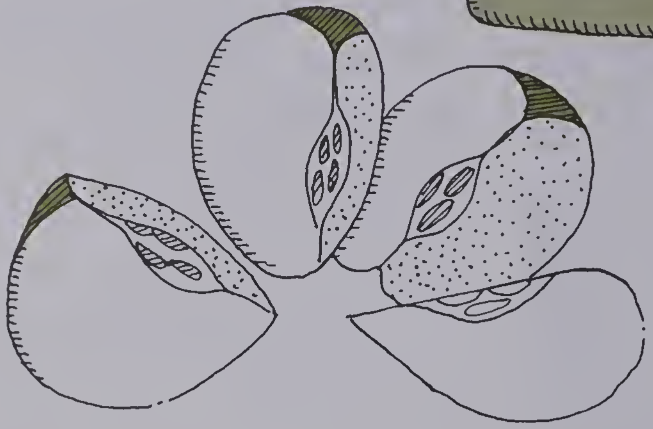
B 7 × 10
C 32 × 10
D 810 ÷ 10
F 6 × 10
G 720 ÷ 10
I 4 × 10
J 83 × 10
M 46 × 10
N smallest 3-digit number
O 500 + 80 + 9
Q 750 ÷ 10
S 9 × 10
T 34 × 10
V 8 × 10
W 2 × 10
Z 200 ÷ 10
AA perimeter of decagon with sides 5 cm long
BB 4 hundreds, 0 tens, and 7
DD 3 × 10
EE smallest 2-digit number
FF 10 × 10

EXPLORE

Halves, Quarters, Tenths

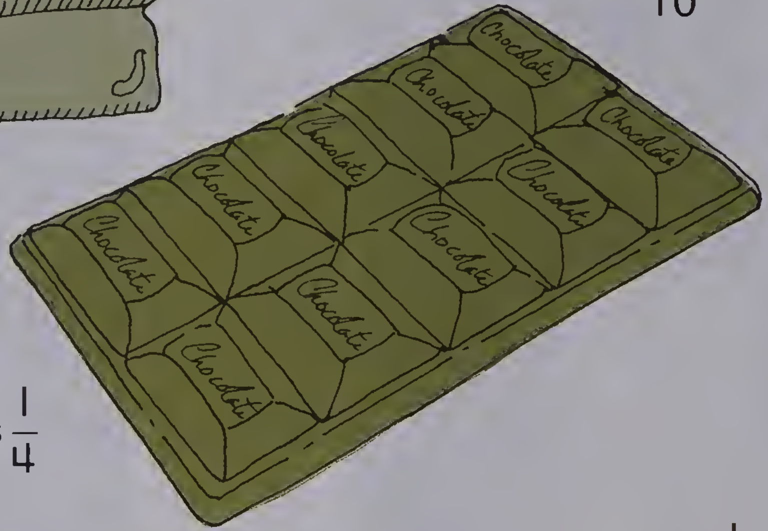
1 loaf of bread
2 equal parts
each part shows $\frac{1}{2}$



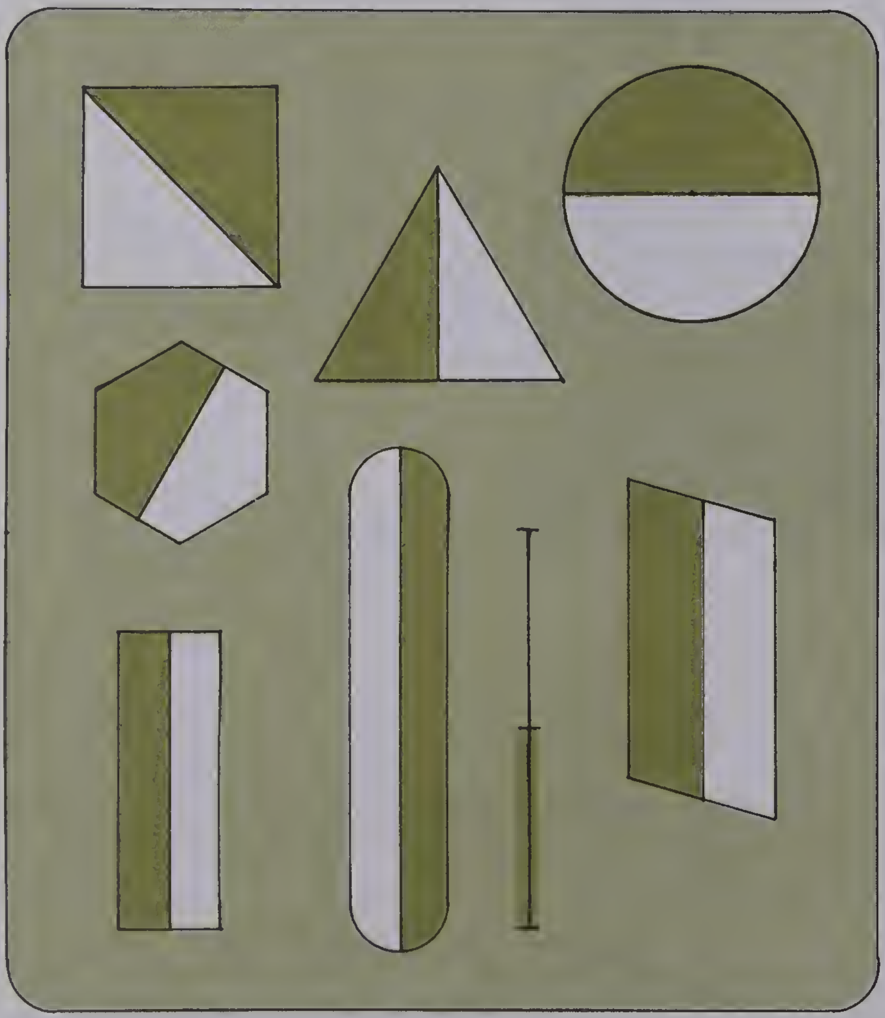


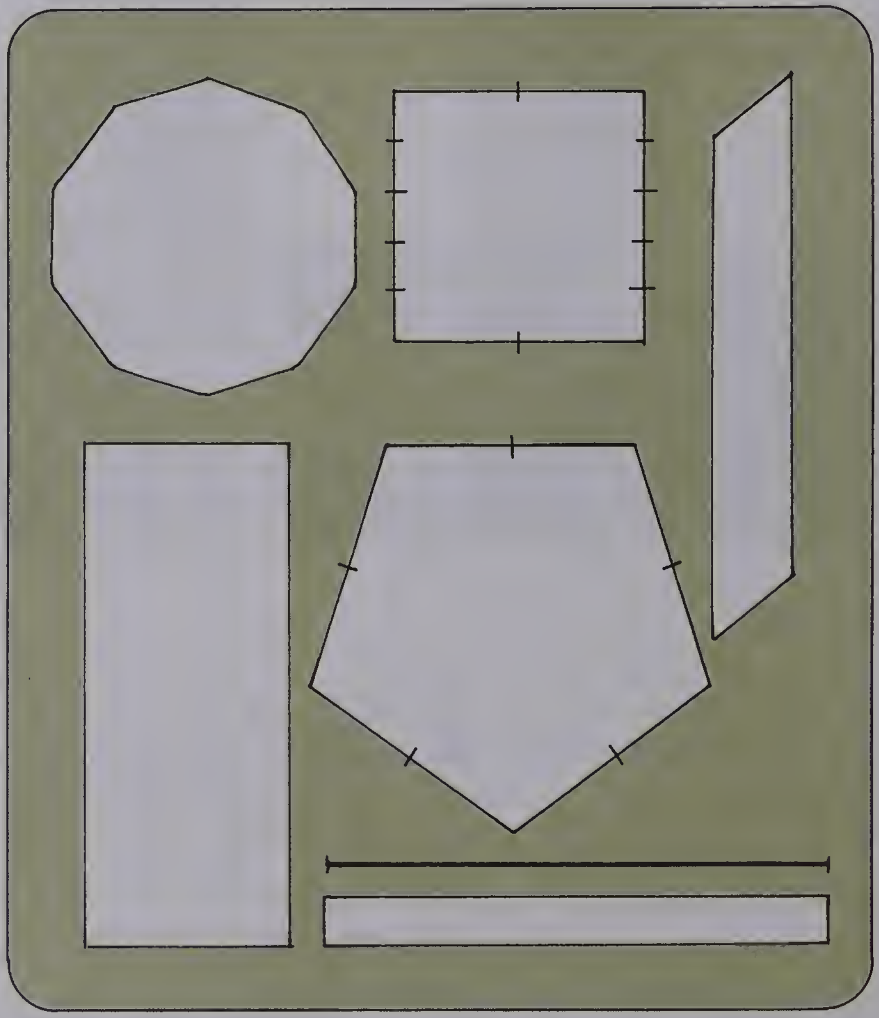
1 apple
4 equal parts
each part shows $\frac{1}{4}$

1 chocolate bar
10 equal parts
each part shows $\frac{1}{10}$


Chocolate
Chocolate
Chocolate
Chocolate
Chocolate
Chocolate
Chocolate
Chocolate
Chocolate
Chocolate

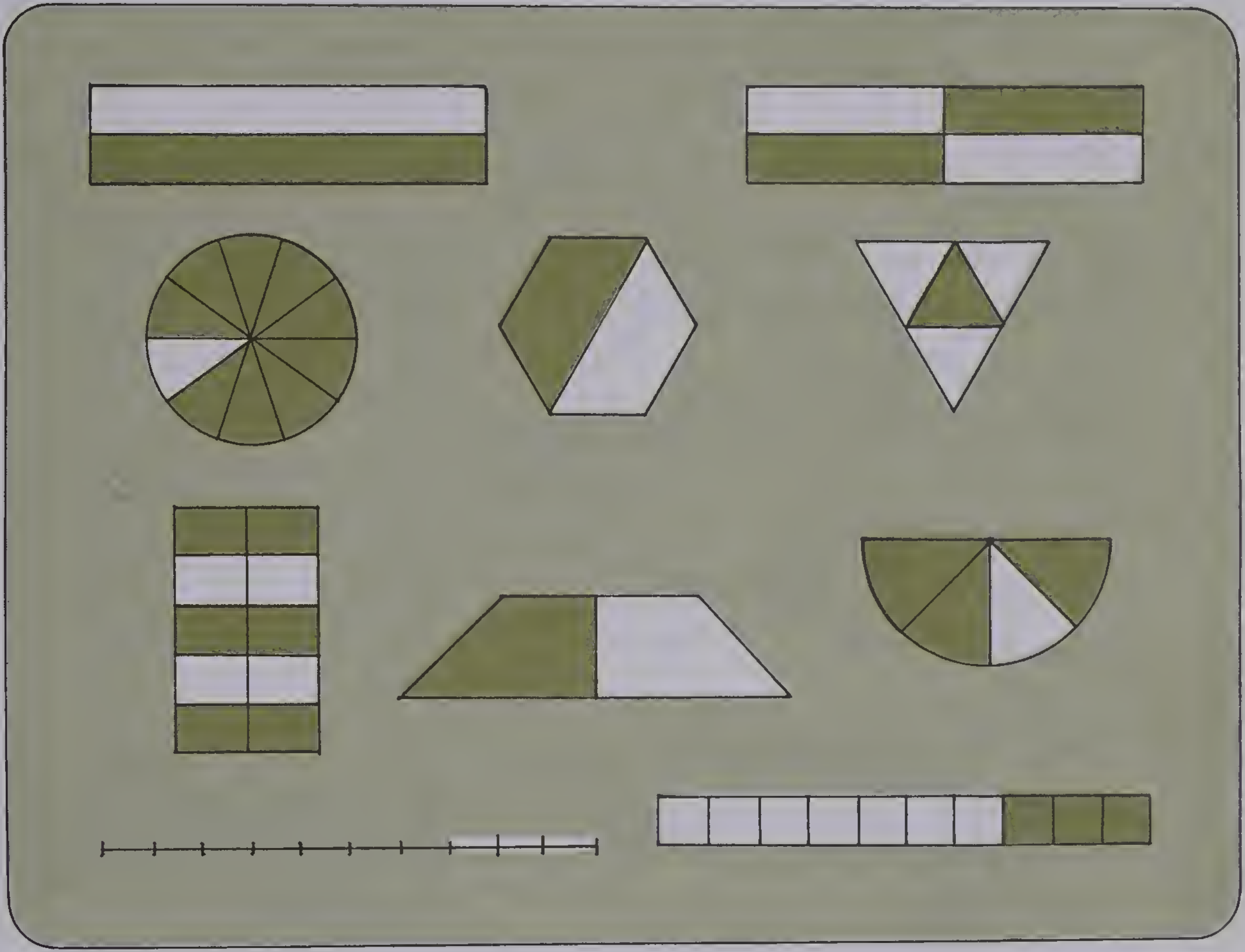
Each picture shows $\frac{1}{2}$. Draw pictures to show $\frac{1}{4}$. Trace the shapes. Use each picture to show $\frac{1}{10}$.



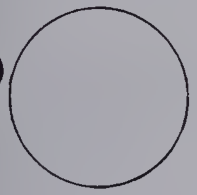


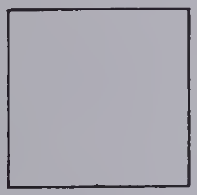
IN ACTION

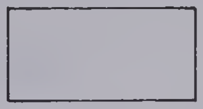
1. For each diagram,
   a) write the number of equal parts
   b) write the fraction that each part shows
   c) write the fraction that shows what part is shaded.

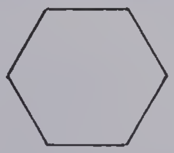


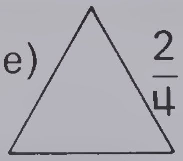
2. Use a figure like the one given to show the fraction. Trace the shapes on page 74.

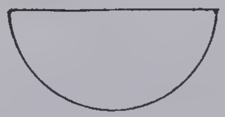
a)  $\frac{1}{2}$

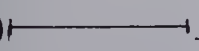
b)  $\frac{3}{4}$

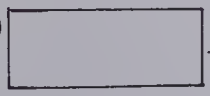
c)  $\frac{7}{10}$

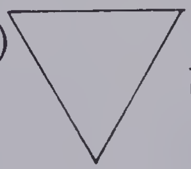
d)  $\frac{2}{2}$

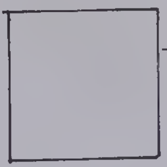
e)  $\frac{2}{4}$

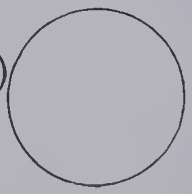
f)  $\frac{1}{2}$

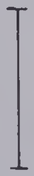
g)  $\frac{3}{10}$

h)  $\frac{5}{10}$

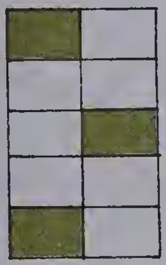
i)  $\frac{1}{4}$

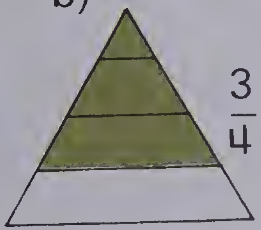
j)  $\frac{2}{10}$

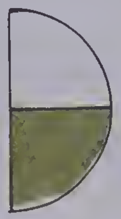
k)  $\frac{4}{4}$

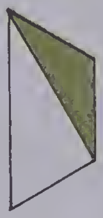
l)  $\frac{4}{10}$

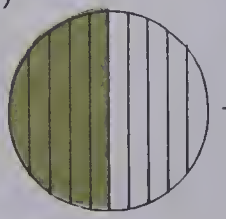
3. Does the picture show the fraction?

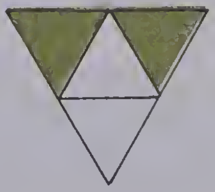
a)  $\frac{3}{10}$

b)  $\frac{3}{4}$

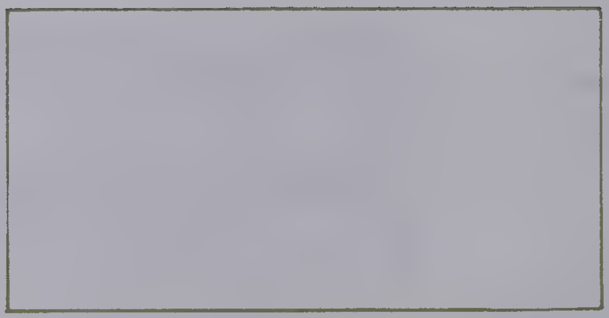
c)  $\frac{1}{4}$

d)  $\frac{1}{2}$

e)  $\frac{5}{10}$

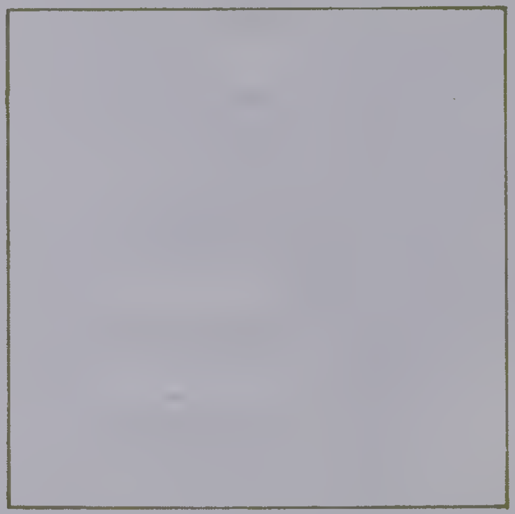
f)  $\frac{2}{4}$

4. a) Trace this rectangle.
Divide it into 2 equal parts.
Show $\frac{1}{2}$.



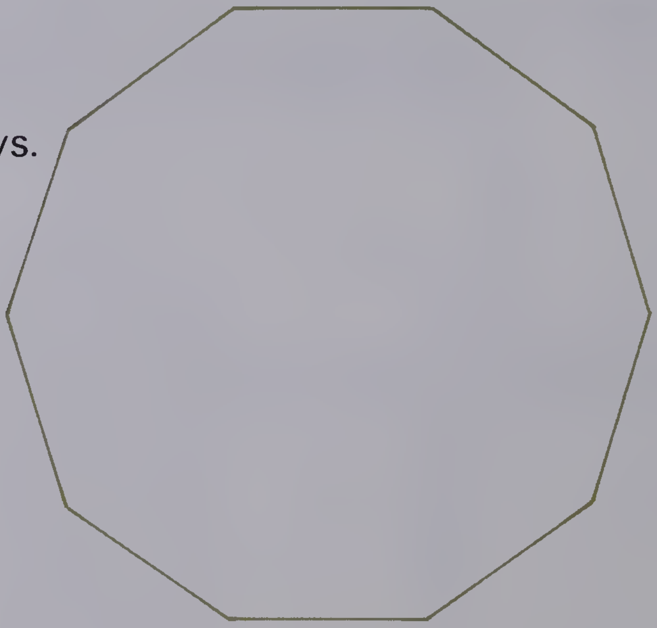
b) How many different ways can you divide a rectangular shape into 2 equal parts?
Draw diagrams of the different ways.

5. a) Trace this square.
Divide it into 4 equal parts.
Show $\frac{3}{4}$.



b) How many different ways can you divide a square shape into 4 equal parts?
Draw diagrams of the different ways.

6. Trace this figure.



a) Shade $\frac{1}{2}$ red.

b) Shade $\frac{1}{4}$ blue.

c) Shade $\frac{1}{10}$ yellow.

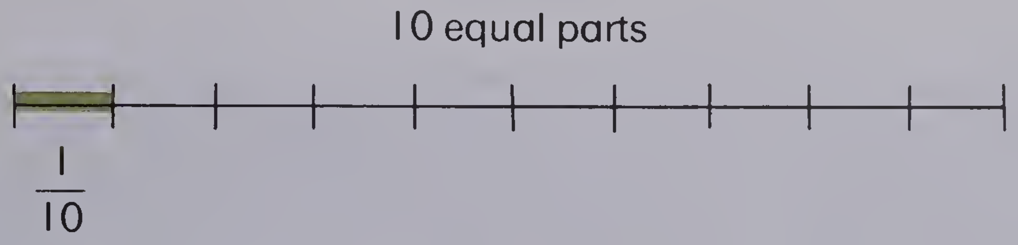
7. a) Draw a line segment 10 cm long.
Show $\frac{4}{10}$.

b) Draw a line segment 10 cm long.
Show $\frac{1}{2}$.

c) Draw a line segment 12 cm long.
Show $\frac{3}{4}$.

d) Draw a line segment 20 cm long.
Show $\frac{1}{10}$.

0.1 Zero Decimal One


10 equal parts
1
10

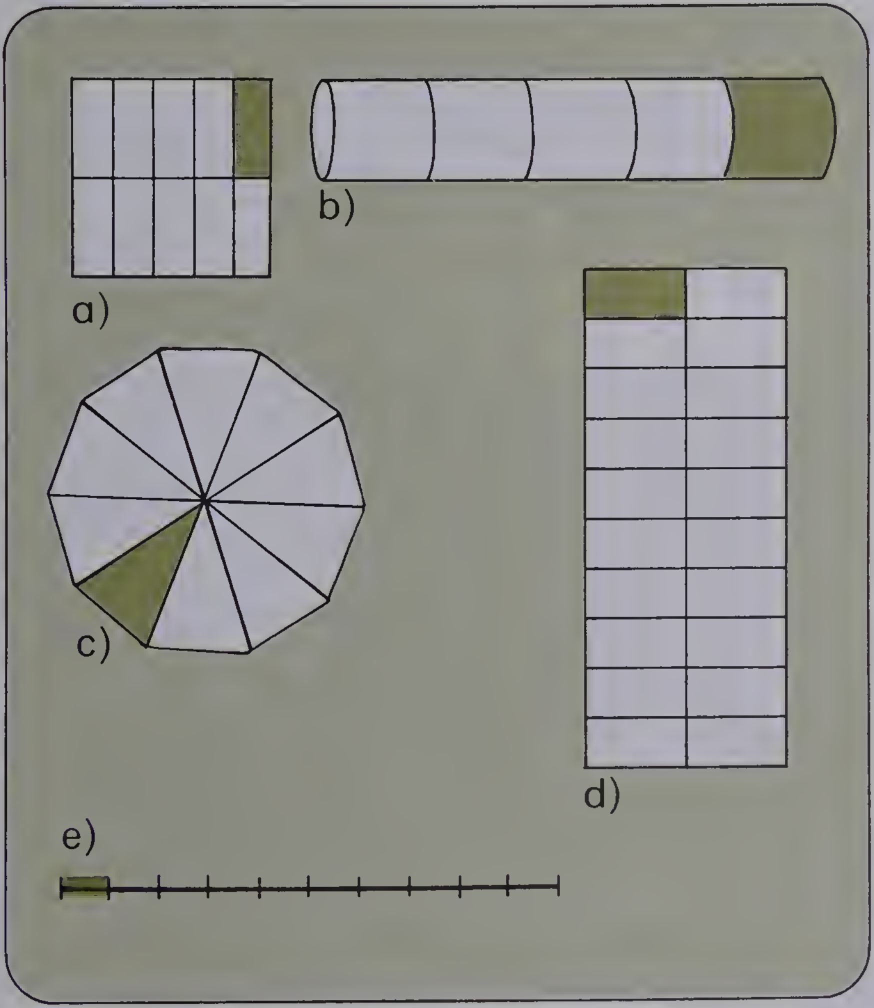
0.1 is another name for $\frac{1}{10}$.

$\downarrow$ zero decimal one

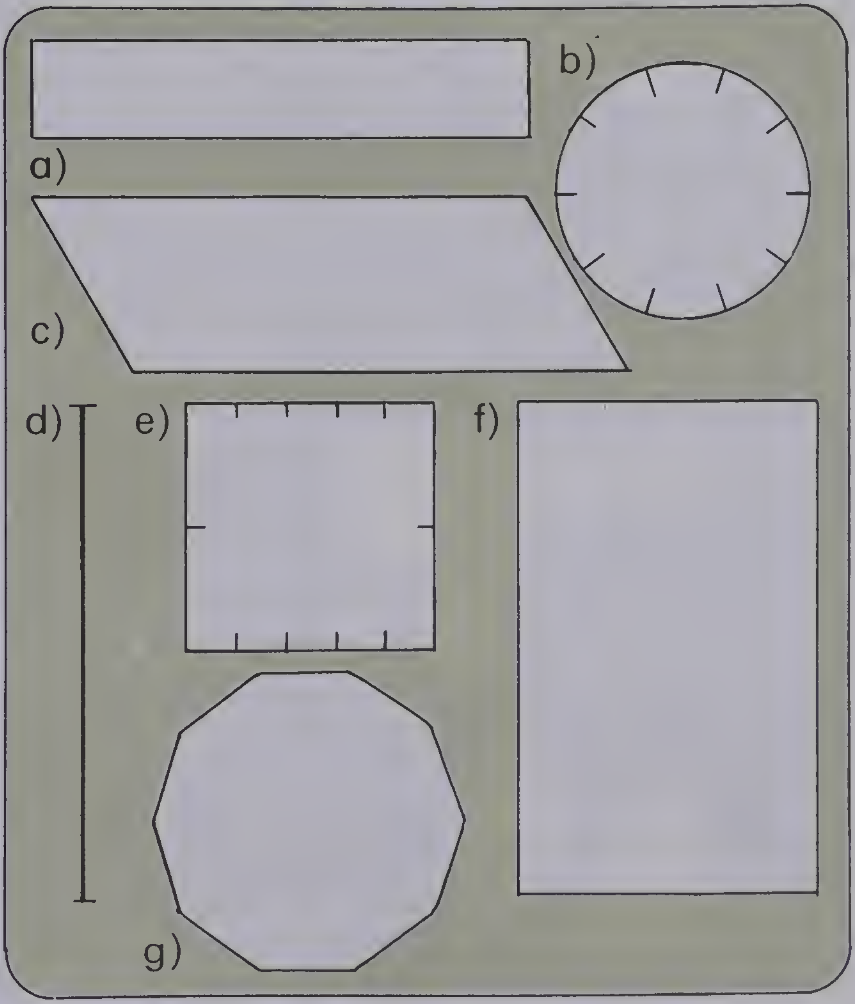
$\downarrow$ one-tenth

IN ACTION

1. Which pictures show 0.1?



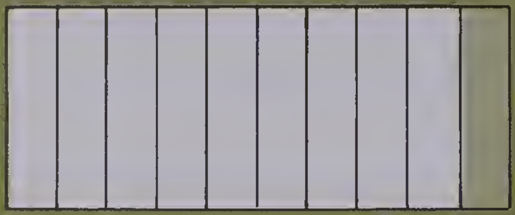
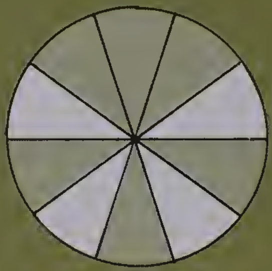
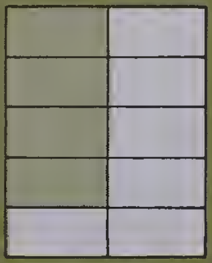
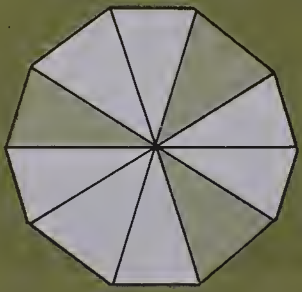
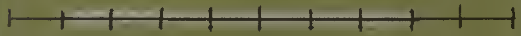
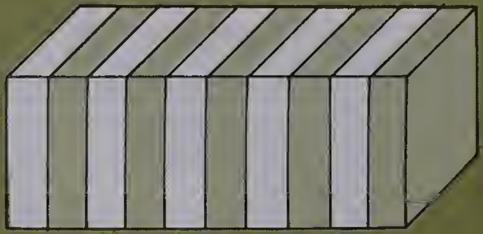
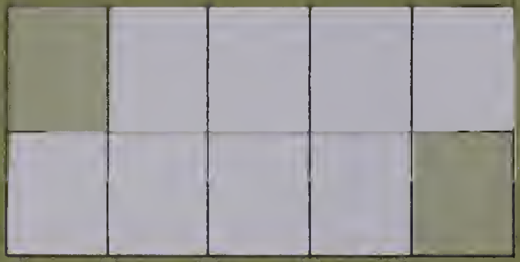
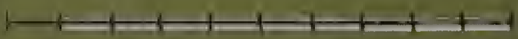
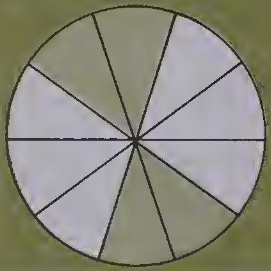
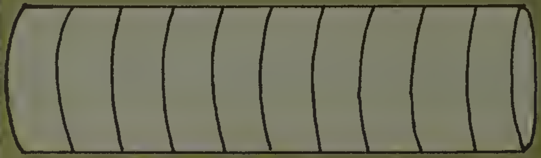
2. Use these figures to show 0.1.



EXPLORE

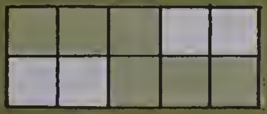
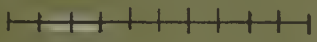
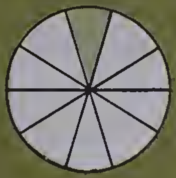
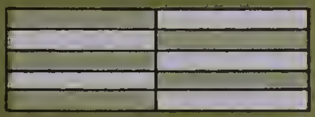
Decimals 0.1 to 0.9

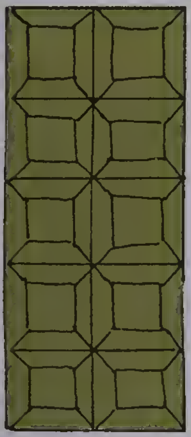
Complete the chart in your notebook.

DIAGRAM	FRACTION	DECIMAL	DIAGRAM	FRACTION	DECIMAL
	$\frac{1}{10}$	0.1		$\frac{6}{10}$	
	$\frac{4}{10}$	0.4			
	$\frac{7}{10}$				
		0.2			
					

IN ACTION

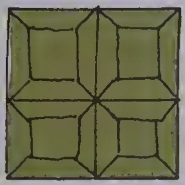
1. Complete the chart in your notebook.

DIAGRAM	DECIMAL	DIAGRAM	DECIMAL	DIAGRAM	DECIMAL
					0.4
			0.8		0.7
			0.9		0.3

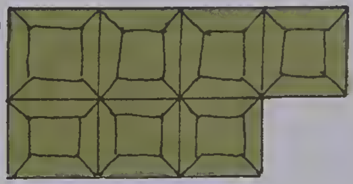


2. This is the whole chocolate bar.
What decimal does each part represent?

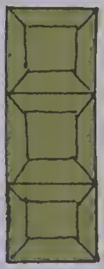
a)



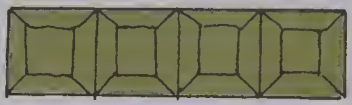
b)



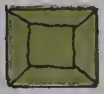
c)



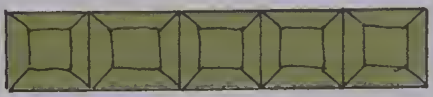
d)



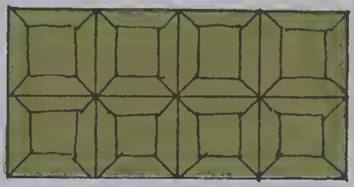
e)



f)



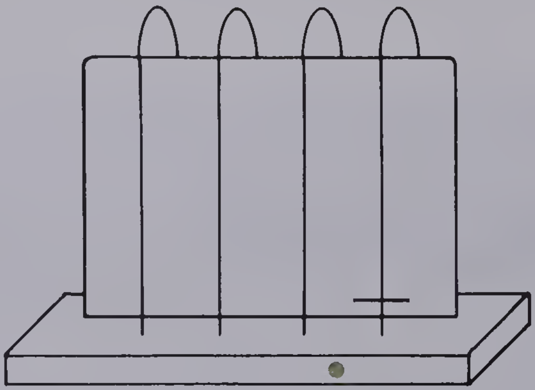
g)

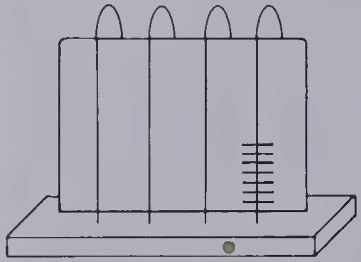


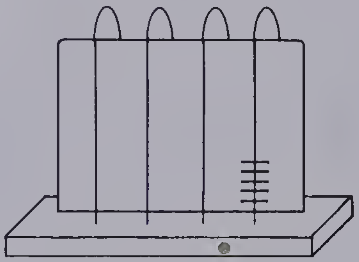
3. Draw line segments 10 cm long. Show the decimals.
a) 0.6 b) 0.3 c) 0.9 d) 0.1 e) 0.5 f) 0.8 g) 0.2 h) 0.7 i) 0.4 j) 1

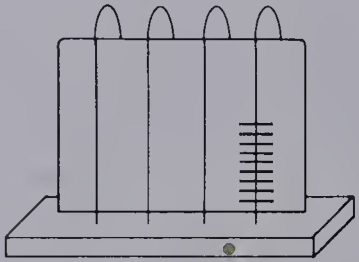
4. Make each sentence true by using the correct symbol, > or < or =.
a) $\frac{5}{10}$? 0.5 b) $\frac{4}{10}$? 0.7 c) 0.8 ? $\frac{3}{10}$ d) 0.7 ? $\frac{7}{10}$ e) $\frac{9}{10}$? 1 f) $\frac{3}{10}$? 0.6

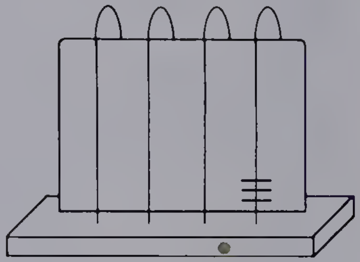
Representing Decimals


0.1


0.7

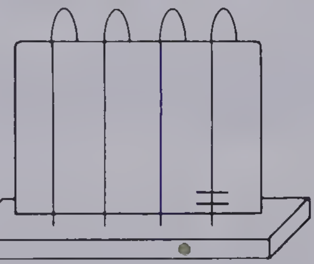

0.5

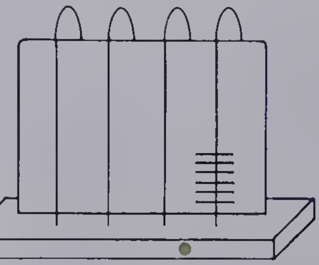

0.9

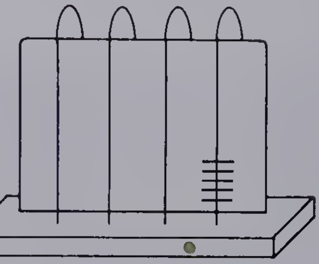

0.3

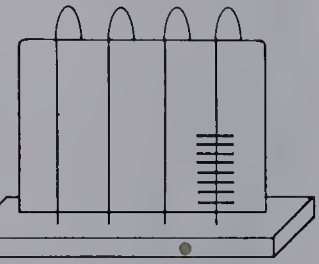
IN ACTION

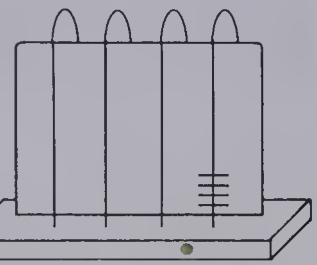
1. What decimals are represented?

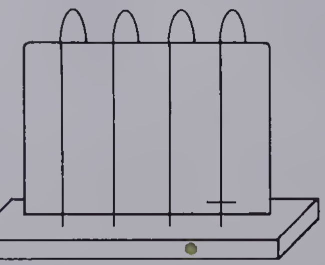
a)


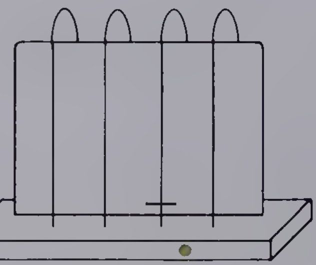
b)


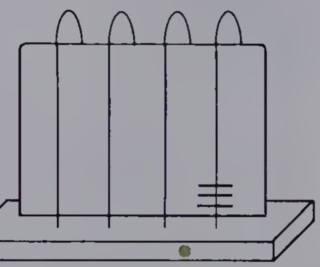
c)


d)


e)


f)


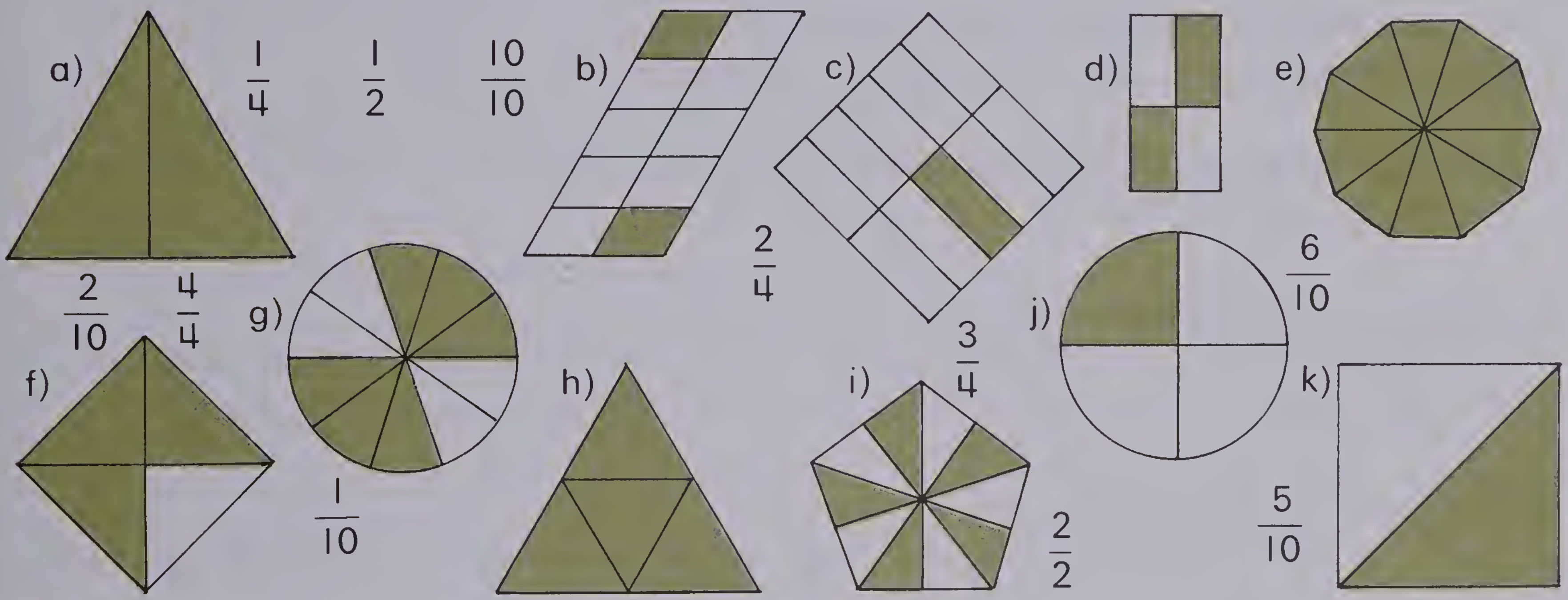
g)


h)


2. Sketch an abacus to show each decimal.
a) 0.3 b) 0.8 c) 0.1 d) 0.6 e) 0.2 f) 0.9 g) 0.4 h) 0.7

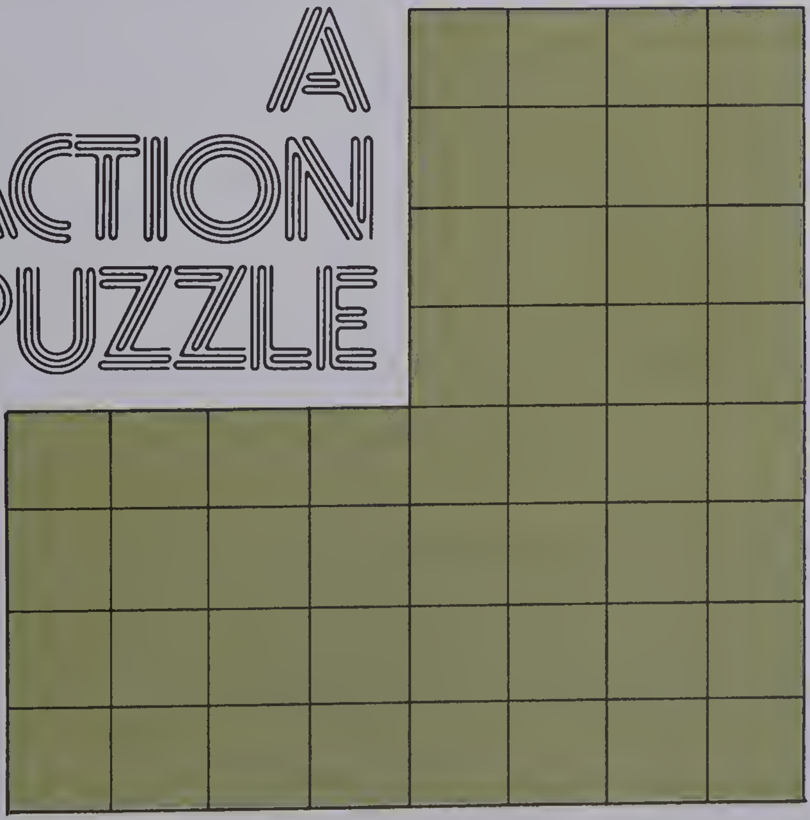
Scrambled Fractions

Match each fraction to a picture that represents it ; for example, $\frac{1}{4}$ matches j).


a)
$\frac{1}{4}$
$\frac{1}{2}$
$\frac{10}{10}$
b)
c)
d)
e)
$\frac{2}{4}$
$\frac{6}{10}$
$\frac{2}{10}$
$\frac{4}{4}$
g)
j)
$\frac{3}{4}$
f)
h)
i)
k)
$\frac{1}{10}$
$\frac{2}{2}$
$\frac{5}{10}$

Sort the fractions. Tell how you sorted them.

A FRACTION PUZZLE



Draw 3 figures like this in your notebook.

Divide the first figure into 2 equal parts. What fraction does each part represent?

Divide the second figure into 3 equal parts. What fraction does each part represent?

Divide the last figure into a different number of equal parts. What fraction does each part represent?

Unit 1, Check 1

Do you understand the meaning of numbers
and the basic addition and subtraction facts?
Check your answers with those at the bottom of the page.
If you are not happy with your understanding, try Practice 1 on page 83.

1. What is the meaning of the digit 4 in each of these numerals?
   a) 74 b) 49 c) 304 d) 416 e) 942 f) 453

2. What numbers are represented?
   a) $30 + 7$ b) $20 + 20 + 20 + 20 + 7$ c) 1 hundred, 6 tens, and 8
   d) $600 + 90 + 1$ e) $700 + 30 + 0$ f) 2 dimes and 5 pennies

3. Think addition. Write the answers.
   a) (2, 12) b) (3, 15) c) (17, 3) d) (13, 4) e) (3, 13) f) (12, 7) g) (15, 3) h) (14, 6)

4. Think subtraction. Write the answers.
   a) (12, 10) b) (15, 4) c) (20, 13) d) (17, 5) e) (14, 11) f) (18, 7) g) (17, 2) h) (20, 3)

5. Add. Remember your facts.

33	84	45	56	29	78
4	6	8	6	5	4

6. Subtract.

68	94	21	52	73	40
5	3	6	7	8	9

7. Solve.
   a) $k = 3 + 14$ b) $n = 20 - 14$ c) $a = 11 + 3$ d) $9 + y = 11$
   e) $w = 31 - 2$ f) $m = 67 + 9$ g) $86 - p = 77$ h) $r - 6 = 84$

1. a) 4 ones b) 4 tens c) 4 ones d) 4 hundreds e) 4 tens f) 4 hundreds
2. a) 37 b) 87 c) 168 d) 691 e) 730 f) 25
3. a) 14 b) 18 c) 20 d) 17 e) 16 f) 19 g) 18 h) 20
4. a) 2 b) 11 c) 7 d) 12 e) 3 f) 11 g) 15 h) 17
5. 37, 90, 53, 62, 34, 82 6. 63, 91, 15, 45, 65, 31
7. a) $k = 17$ b) $n = 6$ c) $a = 14$ d) $y = 2$ e) $w = 29$ f) $m = 76$ g) $p = 9$ h) $r = 90$

Practice I

1. Complete.

a) 25 = 20 + ?
b) 573 = ? + ? + 3
c) 87 means ? tens and ?
d) 290 means ? hundreds, ?, and 0

2. Add. If you need help, see the Skill Chart on page 12.

a) (7, 2) b) (5, 11) c) (6, 14) d) (9, 11) e) (8, 7) f) (9, 1) g) (9, 9) h) (5, 14)

3. Subtract. Use the Skill Chart to find answers you don't know.

a) (12, 3) b) (15, 7) c) (17, 12) d) (13, 5) e) (14, 12) f) (11, 1) g) (16, 3) h) (20, 16)

4. Add.

a) $\begin{array}{r} 5 \\ 7 \\ 8 \\ \hline \end{array}$ Think 15, 20
b) $\begin{array}{r} 4 \\ 9 \\ 8 \\ \hline \end{array}$
c) $\begin{array}{r} 5 \\ 8 \\ 8 \\ \hline \end{array}$
d) $\begin{array}{r} 6 \\ 5 \\ 7 \\ \hline \end{array}$
e) $\begin{array}{r} 9 \\ 7 \\ 8 \\ \hline \end{array}$
f) $\begin{array}{r} 9 \\ 9 \\ 9 \\ \hline \end{array}$
g) $\begin{array}{r} 6 \\ 8 \\ 11 \\ \hline \end{array}$
h) $\begin{array}{r} 9 \\ 6 \\ 12 \\ \hline \end{array}$

5. Complete the patterns.

a) 5 + 7 = 12 to 85 + 7 = ?
b) 8 + 6 = 14 to 88 + 6 = ?
c) 13 − 4 = 9 to 93 − 4 = ?
d) 18 − 9 = 9 to 98 − 9 = ?

6. Add.

$\begin{array}{r} 47 \\ 6 \\ \hline \end{array}$ $\begin{array}{r} 64 \\ 9 \\ \hline \end{array}$ $\begin{array}{r} 24 \\ 8 \\ \hline \end{array}$ $\begin{array}{r} 75 \\ 6 \\ \hline \end{array}$ $\begin{array}{r} 18 \\ 3 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ 4 \\ \hline \end{array}$

7. Subtract. Think about a pattern.

$\begin{array}{r} 50 \\ 1 \\ \hline \end{array}$ $\begin{array}{r} 34 \\ 9 \\ \hline \end{array}$ $\begin{array}{r} 96 \\ 8 \\ \hline \end{array}$ $\begin{array}{r} 21 \\ 8 \\ \hline \end{array}$ $\begin{array}{r} 62 \\ 9 \\ \hline \end{array}$ $\begin{array}{r} 80 \\ 5 \\ \hline \end{array}$

8. What number does each letter represent?

a) $k = 5 + 13$
$k = ?$
b) $n = 17 - 15$
c) $w = 2 + 11$
d) $p = 20 - 7$
e) $q + 2 = 20$
f) $m - 15 = 4$
g) $y = 41 - 7$

9. Use > or < or = to complete each sentence.

a) 19 ? 16 + 3
b) 8 ? 18 − 12
c) 17 − 11 ? 9
d) 10 + 9 ? 12 + 8
e) 20 − 8 ? 19 − 6

Unit I, Check 2

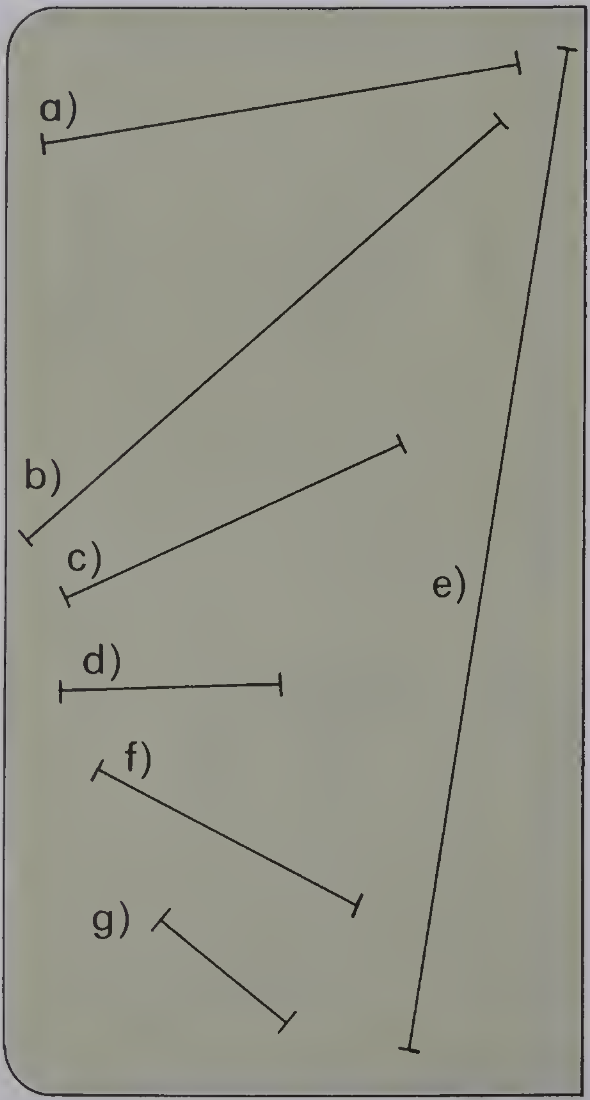
Do you understand length, perimeter, and area well enough?

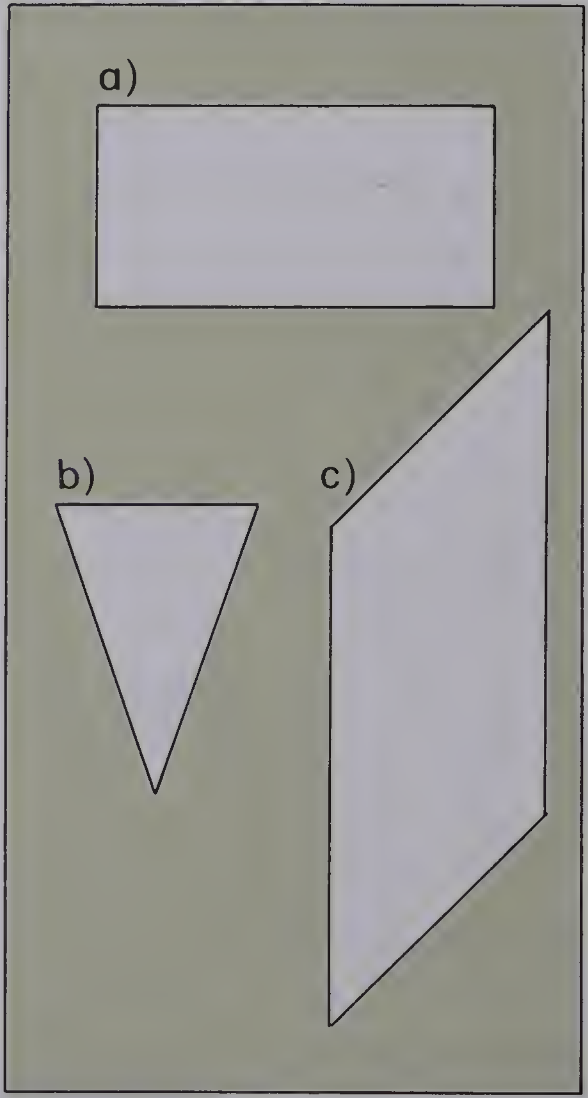
1. Which are related to measuring length?
   a) a metre tape b) counting squares c) measuring around an object
   d) a litre container e) a balance f) a piece of string

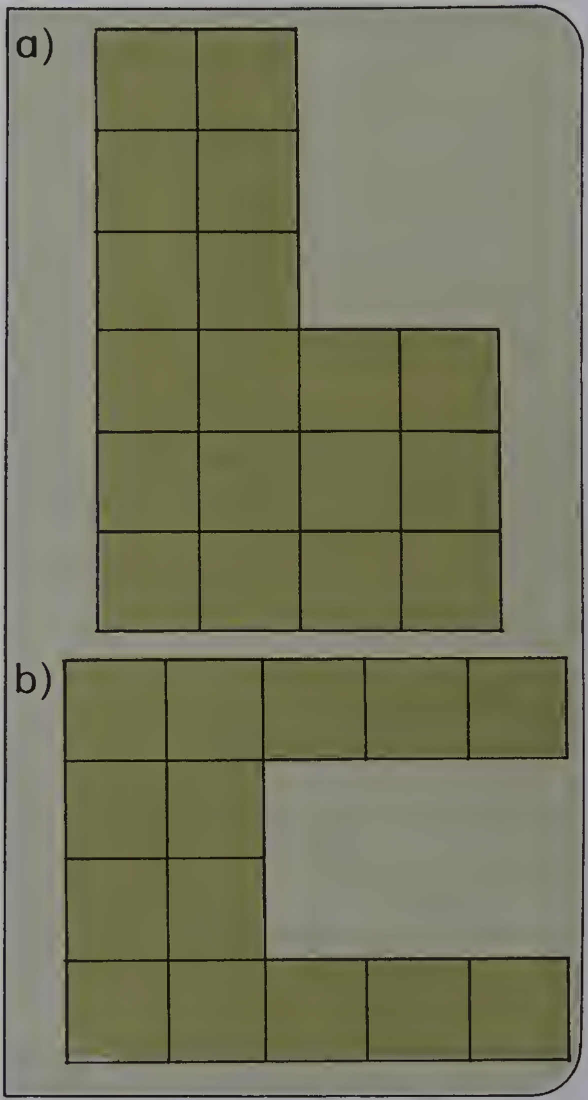
2. Guess the length of each line segment. Measure it to the nearest centimetre.

3. Find the perimeter of each figure. Name the figures.

4. Find the area of each shape. What letters could the shapes represent?



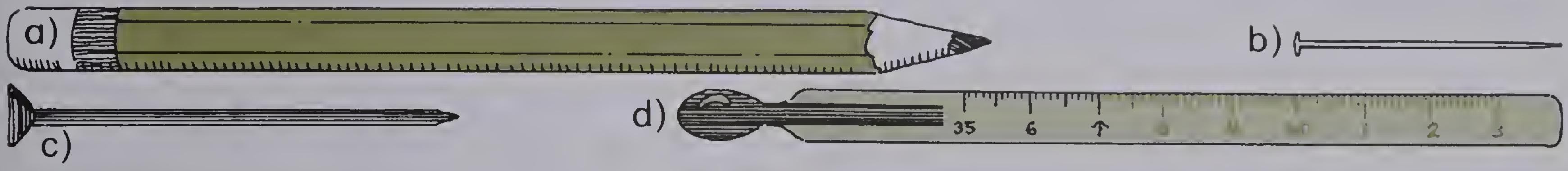




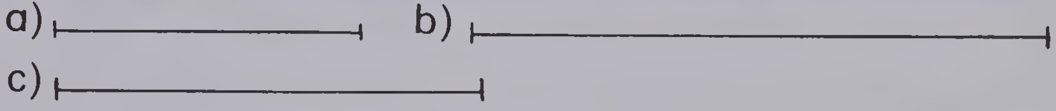
1. a), c), f)
2. a) 5 cm b) 6 cm c) 4 cm d) 2 cm e) 10 cm f) 3 cm g) 2 cm
3. a) 12 cm, rectangle b) 8 cm, triangle c) 16 cm, parallelogram
4. a) 18 cm^2, the letter L b) 14 cm^2, the letter C

Practice 2

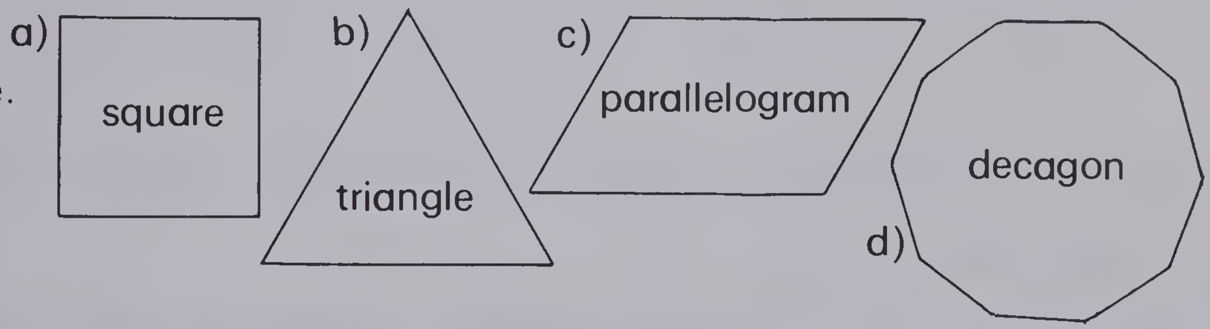
1. Find the length, in centimetres, of each object.



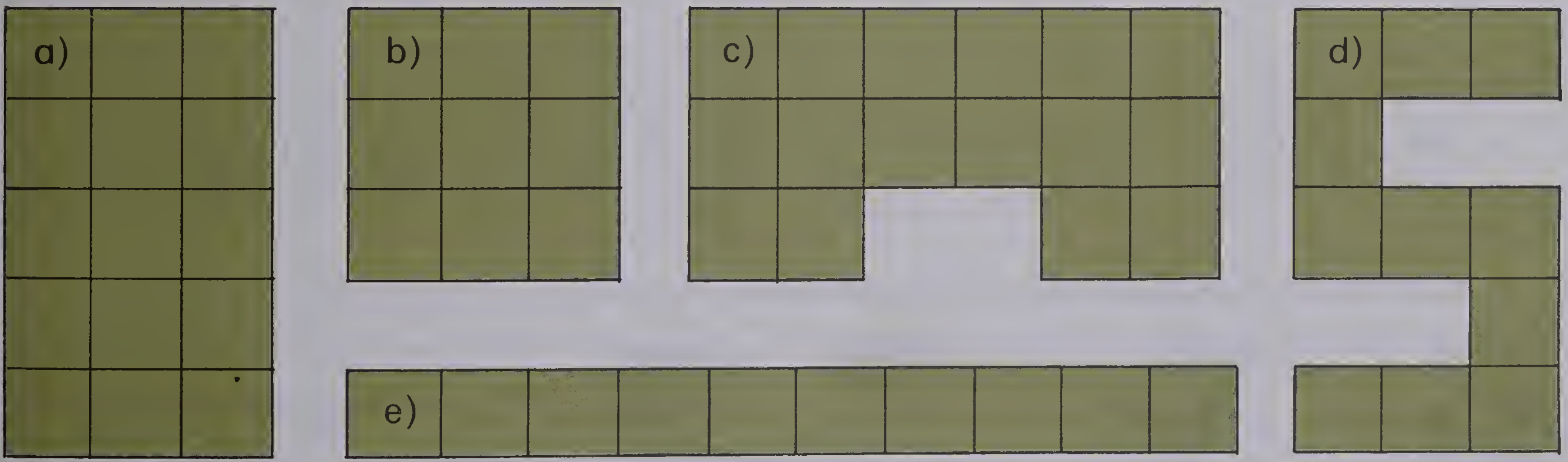
2. Measure each line segment to the nearest centimetre.



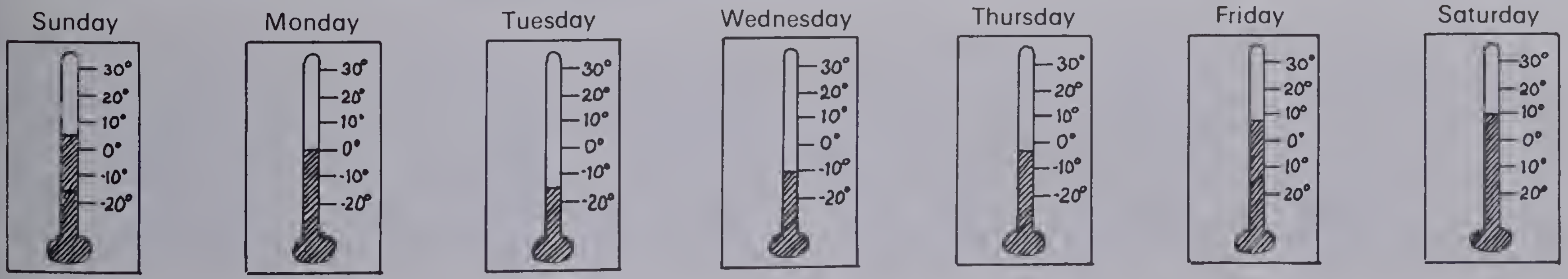
3. Measure the lengths of the sides of each figure. What is the perimeter?


a)
square
b)
triangle
c)
parallelogram
d)
decagon

4. Count square centimetres to find the area of each shape.



5. Record the daily temperatures.


Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
30°
20°
10°
0°
-10°
-20°

Unit I, Check 3

Do you remember how to exchange 10 for 1 and 1 for 10?
Check your skill.

1. Add.

a)	b)	c)	d)	e)	f)	g)	h)
37 ↑	46	63	37	48	39	136	657
49	28	18	26	27	48	19	39

2. Subtract.

a)	b)	c)	d)	e)	f)	g)	h)
63	37	71	84	63	85	351	985
27 ↓	18	29	69	47	57	25	37

3. Subtract the greatest 2-digit number from the least 3-digit number.

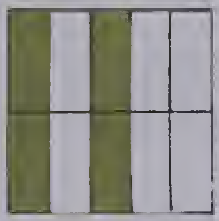
4. Add. Exchange 10 for 1.

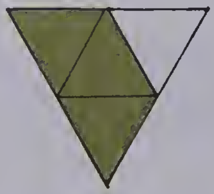
a)	b)	c)	d)	e)	f)	g)	h)
178 ↑	473	627	564	643	678	395	476
356	219	318	292	195	246	547	358

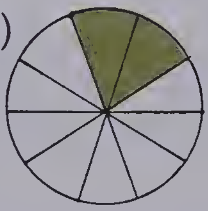
5. Subtract. Exchange 1 for 10.

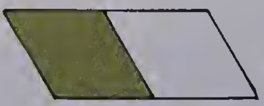
a)	b)	c)	d)	e)	f)	g)	h)
456	645	857	543	836	746	325	653
169 ↓	318	128	172	554	389	146	286

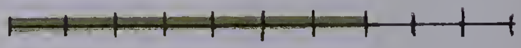
6. Write the fraction represented by each picture.

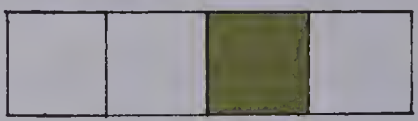
a)


b)


c)


d)


e)


f)


1. a) 86 b) 74 c) 81 d) 63 e) 75 f) 87 g) 155 h) 696
2. a) 36 b) 19 c) 42 d) 15 e) 16 f) 28 g) 326 h) 948
3. 100 − 99 = 1
4. a) 534 b) 692 c) 945 d) 856 e) 838 f) 924 g) 942 h) 834
5. a) 287 b) 327 c) 729 d) 371 e) 282 f) 357 g) 179 h) 367
6. a) $\frac{4}{10}$ b) $\frac{3}{4}$ c) $\frac{2}{10}$ d) $\frac{1}{2}$ e) $\frac{7}{10}$ f) $\frac{1}{4}$

Practice 3

1. Regroup. Exchange 10 for 1.
   a) 70 + 14 or 80 + ? or ?   b) 200 + 130 + 9 or 300 + ? + 9 or ?
   c) 600 + 180 + 17 or 700 + ? + 17 or ? + ? + 7 or ?

2. Regroup. Exchange 1 for 10.
   a) 32 or 30 + ? or 20 + ?
   b) 826 or 800 + ? + ? or 700 + ? + 6
   c) 743 or ? + ? + ? or ? + 30 + ? or 600 + ? + ?

3. Add. Try to think the exchange.

a)	b)	c)	d)	e)	f)	g)	h)
34	26	48	57	63	74	28	76
19	35	37	28	29	16	35	18

4. Subtract.

a)	b)	c)	d)	e)	f)	g)	h)
72	64	68	86	91	75	52	73
29	48	59	47	73	37	36	28

5. Add. Exchange 10 for 1 when you need to.

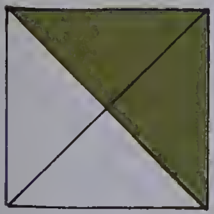
a)	b)	c)	d)	e)	f)	g)	h)
248	547	362	592	385	796	143	527
125	348	443	143	267	178	297	398

6. Subtract. Exchange 1 for 10 when you need to.

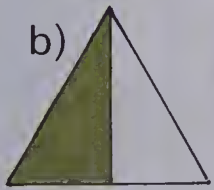
a)	b)	c)	d)	e)	f)	g)	h)
478	214	245	658	462	945	821	714
329	106	163	387	187	486	546	328

7. Into how many equal parts is each shape divided?
   How many parts are shaded? Write the fractions.

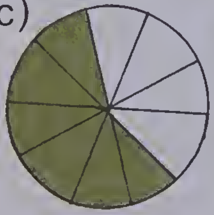
a)



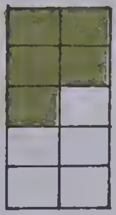
b)



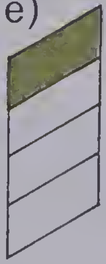
c)



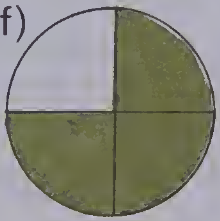
d)



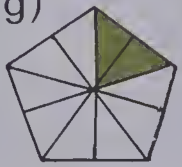
e)



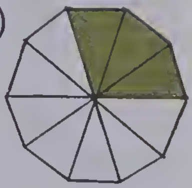
f)



g)



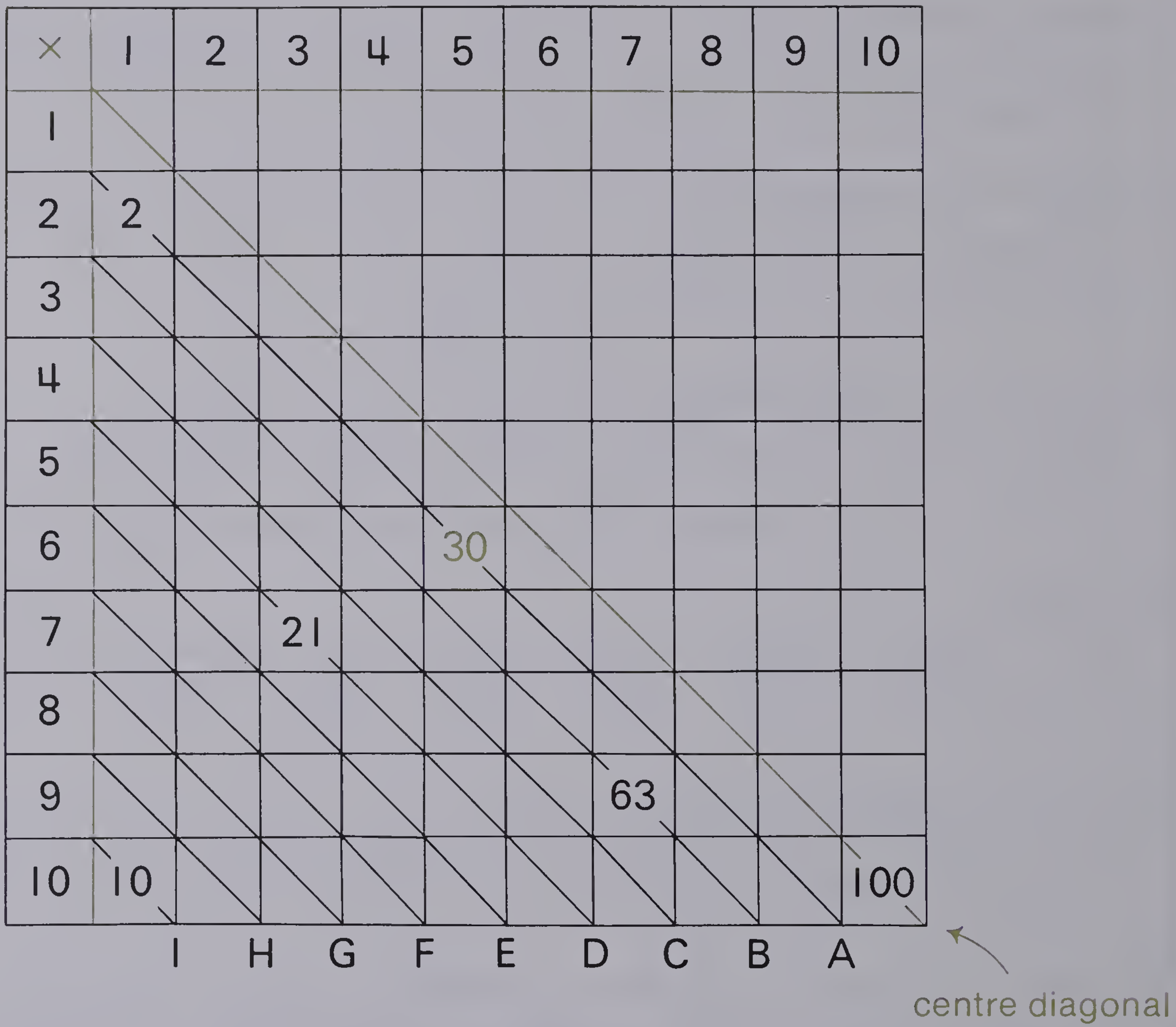
h)



Unit I, Check 4

Recall the basic multiplication and division facts in the chart.

Check your answers with the complete chart on page 65.



×	1	2	3	4	5	6	7	8	9	10
1										
2	2									
3										
4										
5										
6					30					
7			21							
8										
9							63			
10	10									100

Check one diagonal at a time.

For **multiplication**, write the number pair (6, 5) and the product 30.
Change the order of the numerals (5, 6), and write the product 30.
For **division**, write one number pair (30, 5) and the answer 6.
Write the other number pair (30, 6) and the answer 5.

You know that any number times 1 is the number. For example, 8 × 1 = 8.
There are really only 45 facts you need to learn!

Practice 4

1. Write a multiplication sentence for each situation.
   - a) 3 sets, 5 pencils in each set
   - b) 6 sets, 4 blocks in each set
   - c) 5 sets, 8 crayons in each set
   - d) 4 sets, 7 apples in each set

2. Write a division sentence for each situation.
   - a) 20 dimes, 5 in each set
   - b) 42 cans, 6 in each set
   - c) 12 erasers, 4 in each set
   - d) 40 counters, 8 in each set

3. Multiply. Think of equal sets.

   a) (6, 7) b) (2, 5) c) (3, 7) d) (4, 4) e) (6, 3) f) (7, 2) g) (6, 6) h) (4, 3)

4. Divide.

   a) (16, 4) b) (42, 7) c) (28, 4) d) (35, 5) e) (12, 2) f) (21, 3) g) (24, 4) h) (36, 6)

5. Multiply. Try to think the answers.

   a) (4, 9) b) (9, 8) c) (8, 7) d) (9, 6) e) (5, 9) f) (7, 10) g) (9, 4) h) (10, 5)

6. Divide. Think the answers.

   a) (56, 7) b) (48, 6) c) (64, 8) d) (81, 9) e) (24, 3) f) (63, 9) g) (18, 2) h) (32, 4)

7. Solve.

   a) $10 \times k = 30$ b) $8 \times w = 40$ c) $n \times 7 = 63$ d) $p \times 6 = 24$

   e) $60 \div m = 6$ f) $48 \div y = 6$ g) $c \div 9 = 5$ h) $f \div 7 = 4$

8. Divide.

   a) $2\overline{)16}$ b) $3\overline{)27}$ c) $5\overline{)10}$ d) $4\overline{)20}$

   e) $7\overline{)35}$ f) $6\overline{)18}$ g) $8\overline{)72}$ h) $10\overline{)70}$

9. Complete the charts in your notebook.

a)

×	2	6	7
3	6		
5			35
8		48	

b)

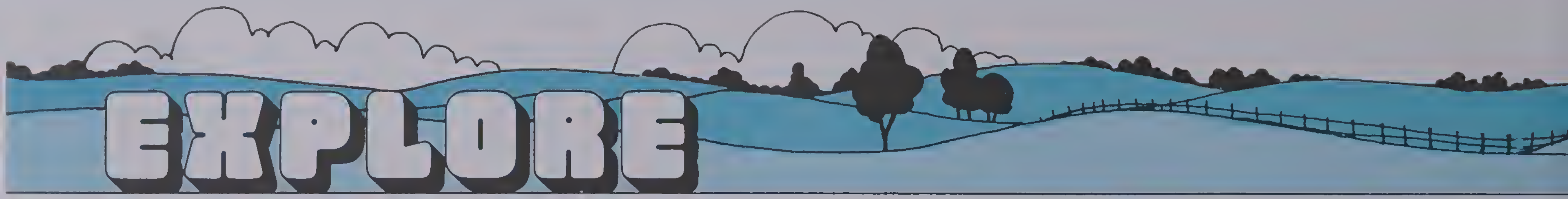
×	4	5	9
2			
7		35	
10			

c)

×	3	6	
		6	
5			
8			56

d)

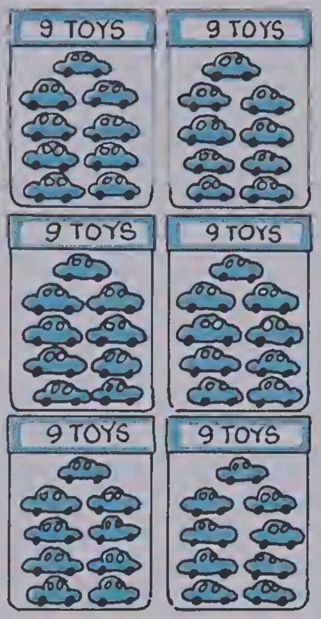
×		5	
4	8		32
		30	
	20		



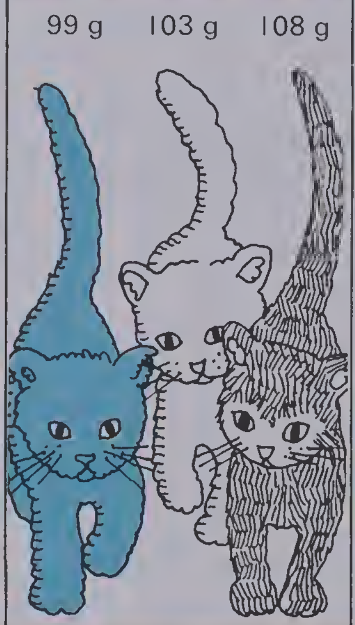
EXPLORE

Picture Problems

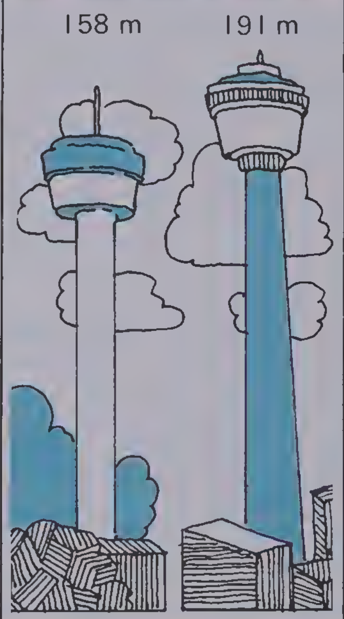
1. How many cars?


9 TOYS
9 TOYS
9 TOYS
9 TOYS
9 TOYS
9 TOYS

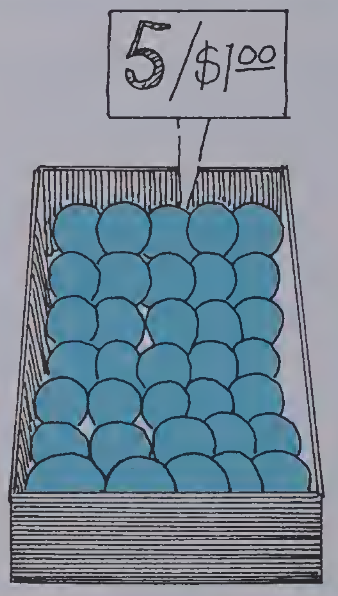
2. Total mass?


99 g
103 g
108 g

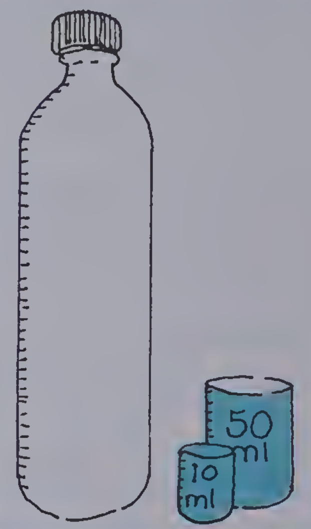
3. Difference?



4. Cost of 35 apples?

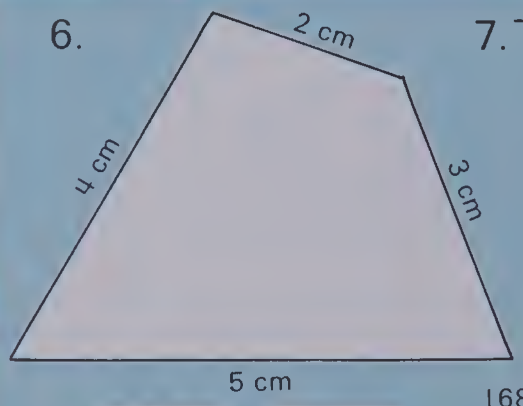


5. Put 40 ml of water in the bottle.

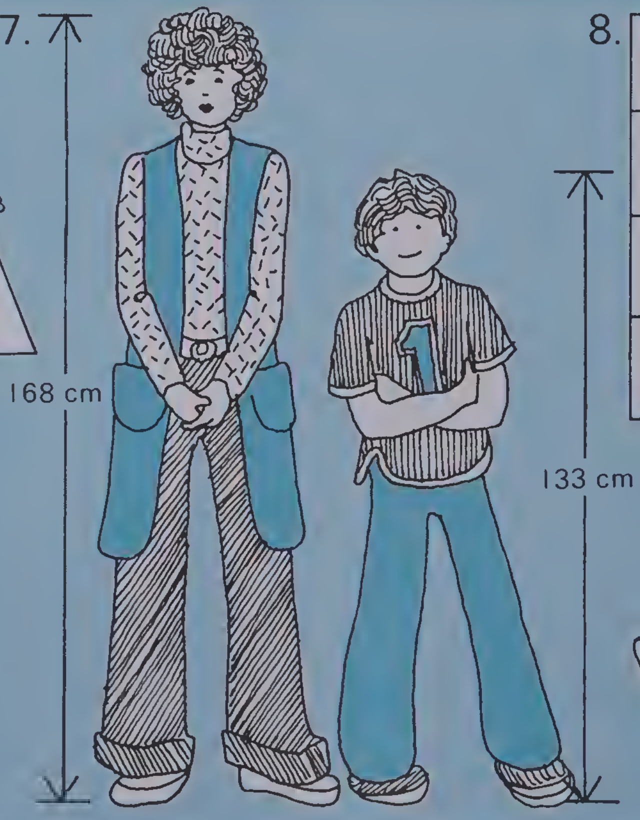


Write problems about these pictures. Solve them.

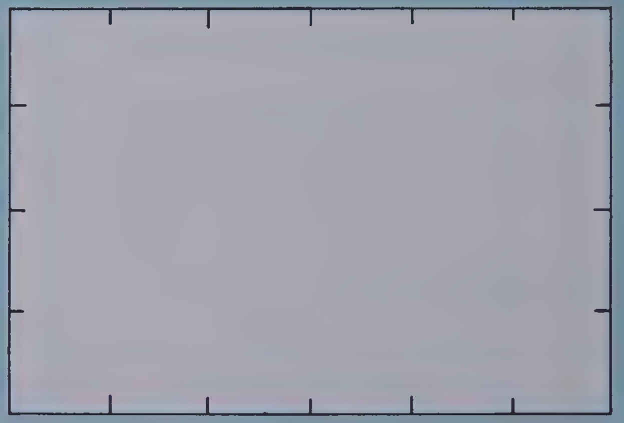
6.


2 cm
4 cm
3 cm
5 cm

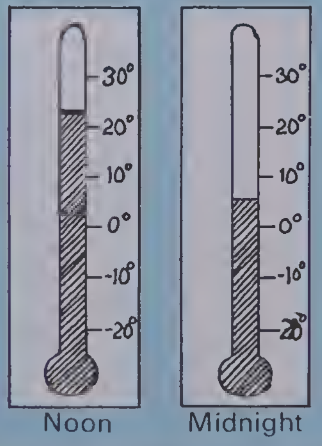
7.


168 cm
133 cm

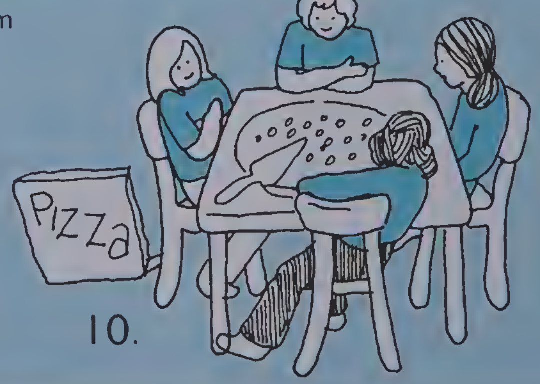
8.



9.


30°
20°
10°
0°
-10°
-20°
30°
20°
10°
0°
-10°
-20°
Noon
Midnight

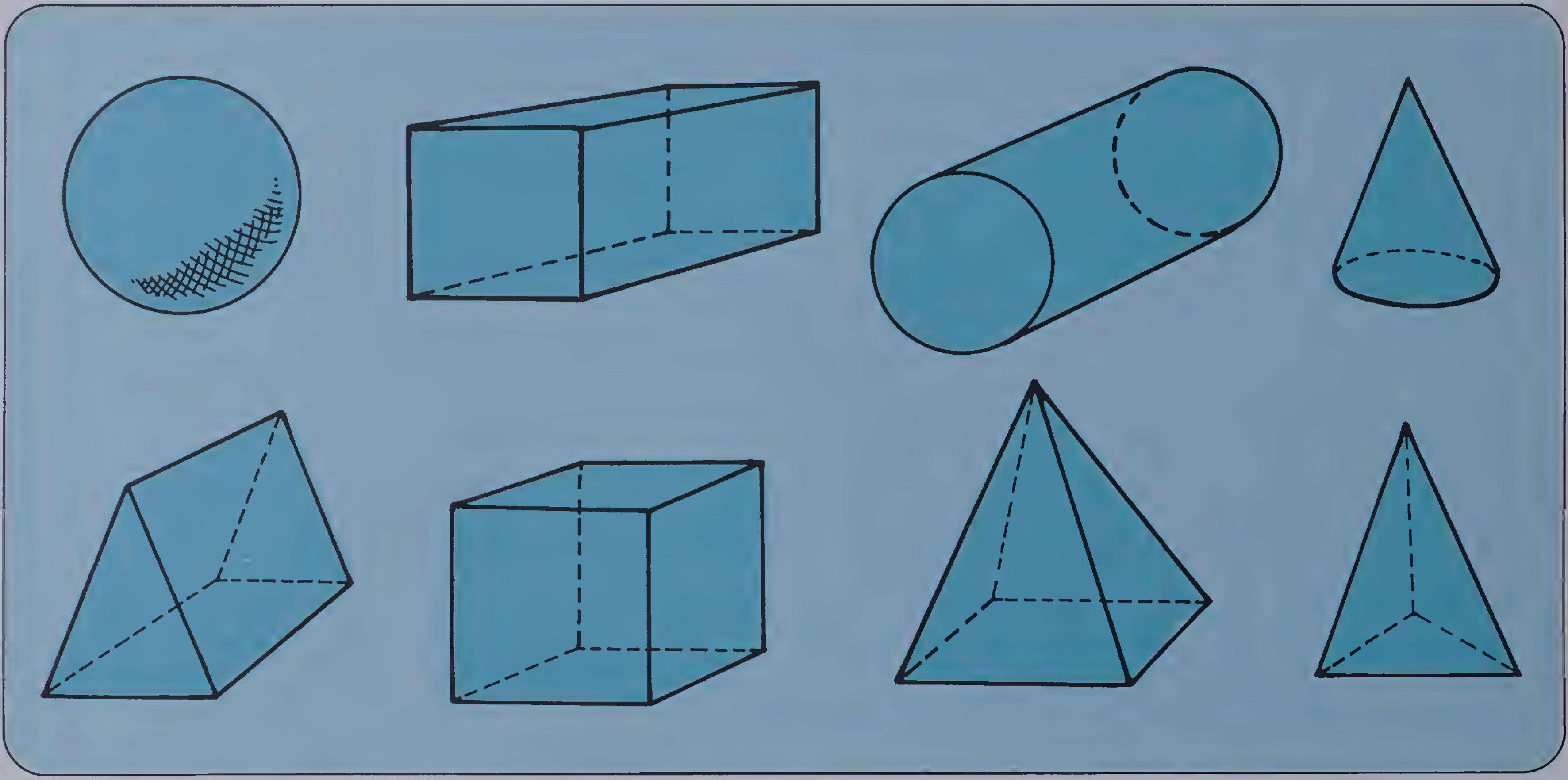
10.



2

EXPLORE

Geometric Models



Examine this set of models carefully.
Name as many as you can.
List the different ways you can sort the models.

How are the models sorted?

- cone
- sphere
- cylinder

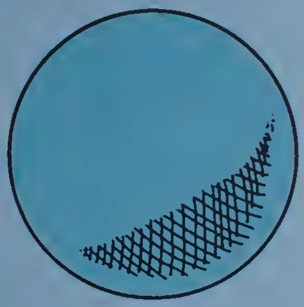
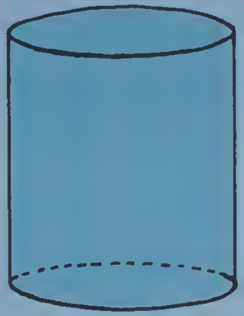
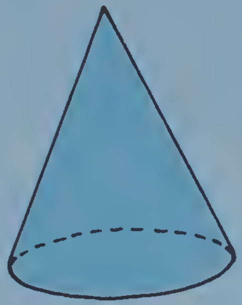
- rectangular prism
- cube
- triangular prism
- triangular pyramid
- square pyramid

Sort the models into 2 different groups.
Make 2 lists.
Ask a friend to tell you how you sorted them.

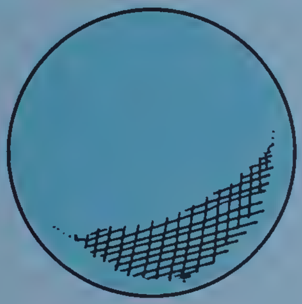
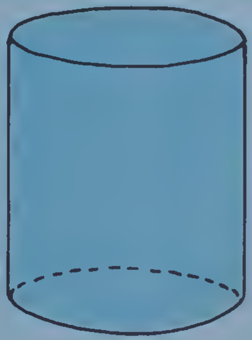
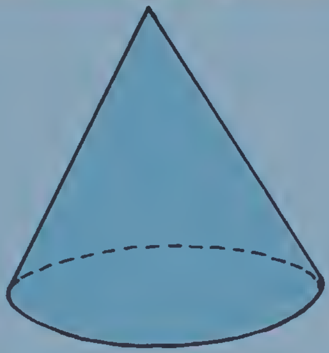
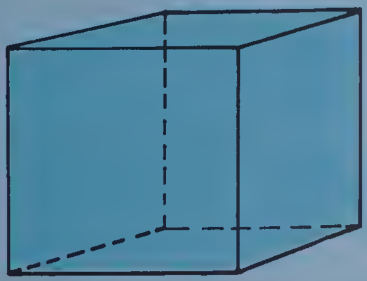
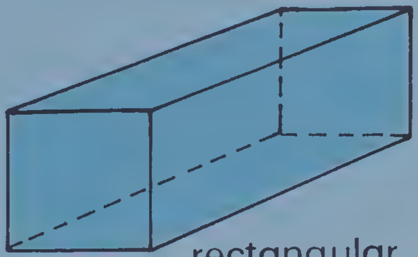
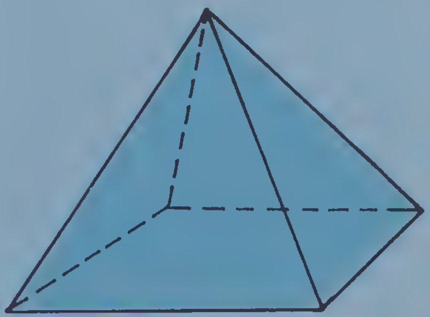
IN ACTION

1. What objects in real life are like geometric models?

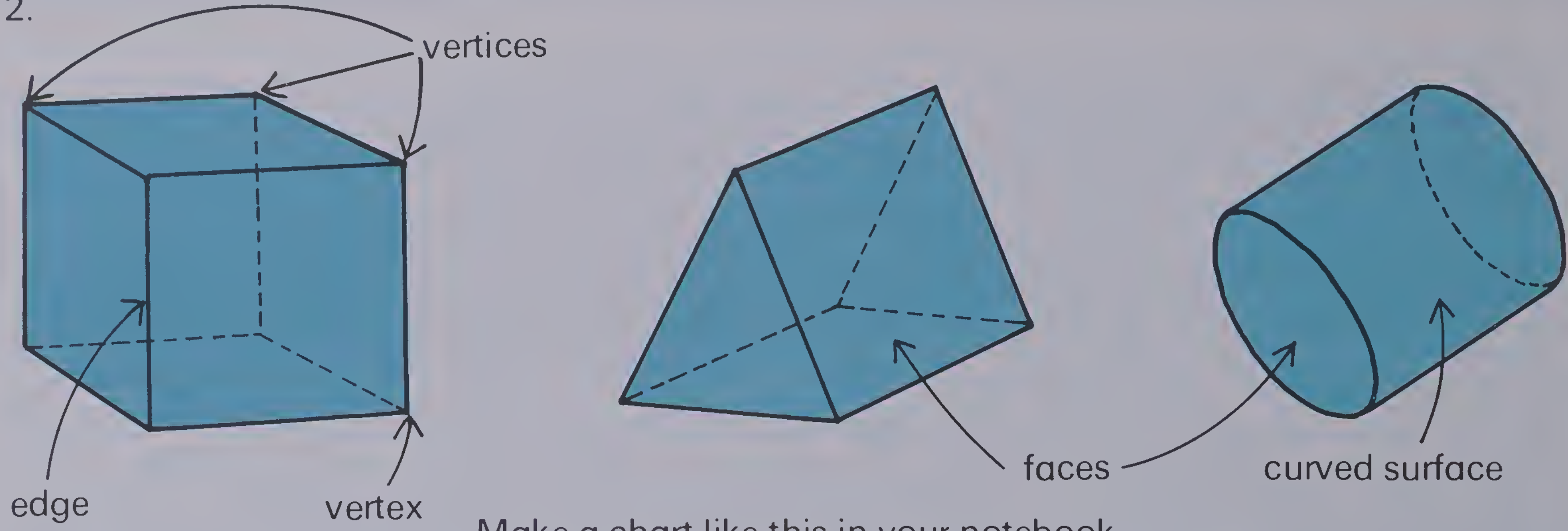
a) List some ways Nature shows each of these.

 sphere	 cylinder	 cone
orange	tree trunk	volcano

b) List some ways we use each of these.

 sphere	 cylinder	 cone
 cube	 rectangular prism	 square pyramid

2.



Make a chart like this in your notebook.
Use models to help you complete it.

Model	Number of faces	Number of curved surfaces	Number of edges	Number of vertices
Cone	1	1	0	1
Sphere				
Cylinder				
Cube				
Rectangular prism				
Square pyramid				
Triangular prism				
Triangular pyramid				

3. a)
I roll.
I have no faces
and no edges.
I have a curved
surface.
What am I?

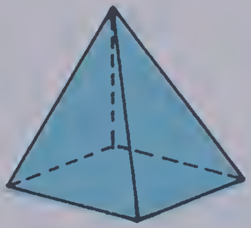
b)
I have 6
faces all the
same shape and
size. I have
12 edges.
What am I?

c)
I slide on all
my 5 faces.
Only 1 of my
faces is square.
My other faces
are the same shape.
What am I?

d) Create a riddle about a different model.

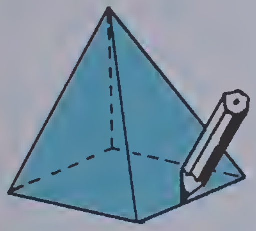
EXPLORE

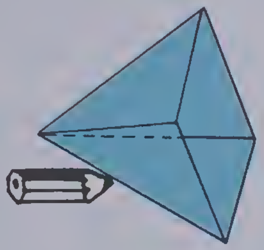
Making Models

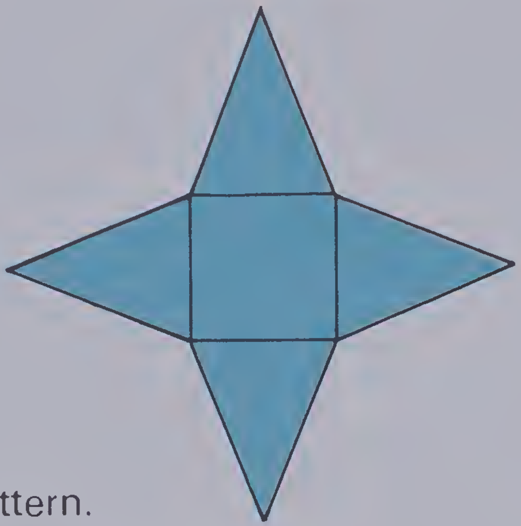


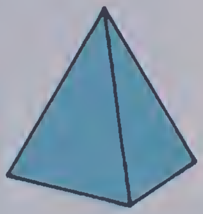
Pick a model.

Draw around the faces of the model to create a pattern.









Cut out the pattern.

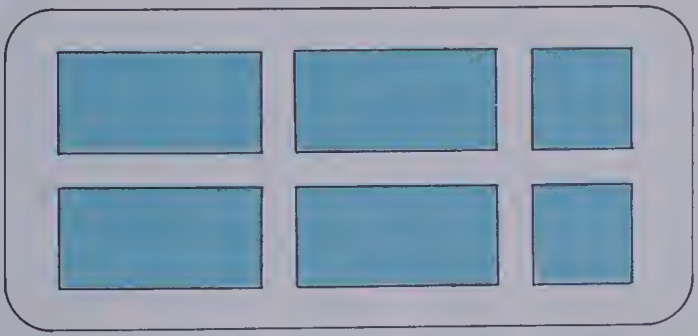
Fold the pattern and tape the edges to make the model.

Make a pattern of another model.

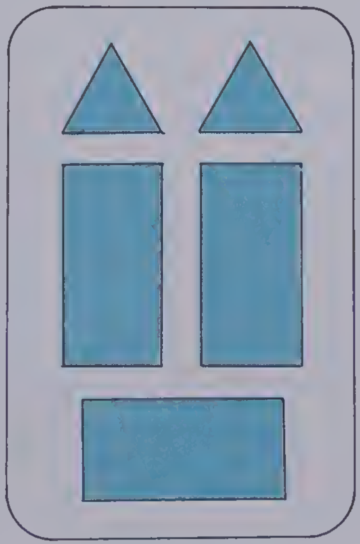
IN ACTION

1. For each set of faces, what is the model?

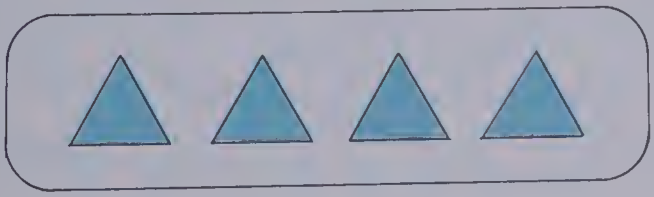
a)



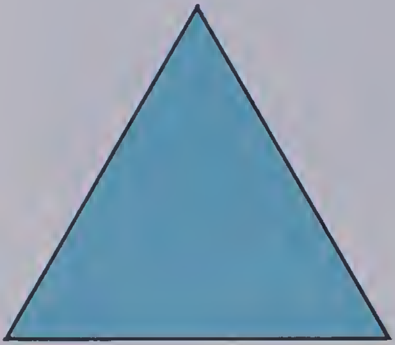
b)

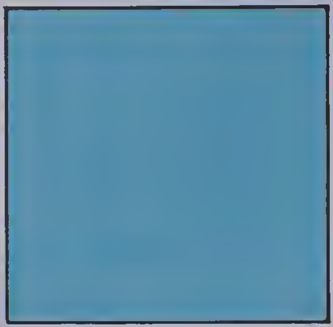


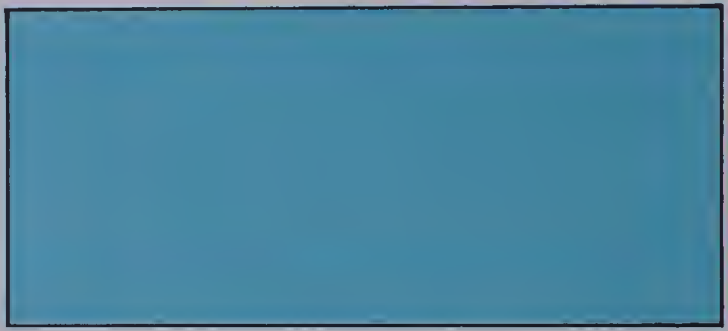
c)

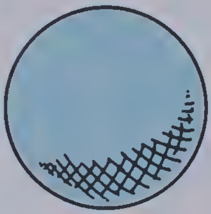


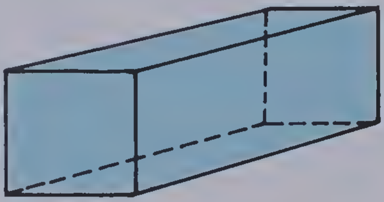
2. What different models can you create by using I, 2 or 3 of these shapes? You may use each shape as many times as you like.

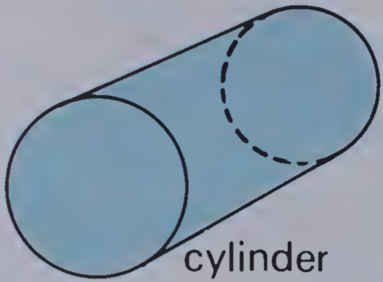

equilateral triangle

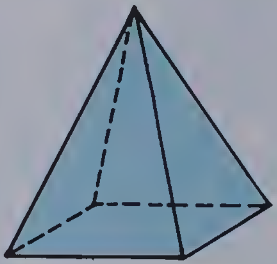

square

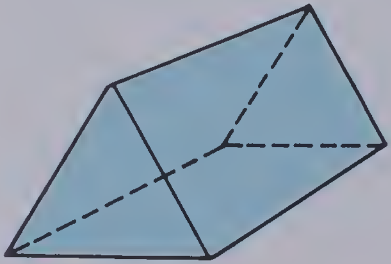

rectangle

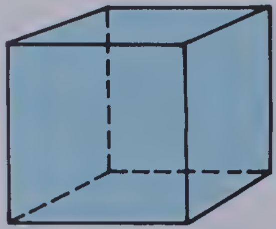

sphere

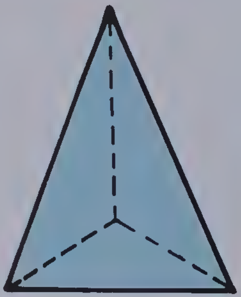

rectangular prism

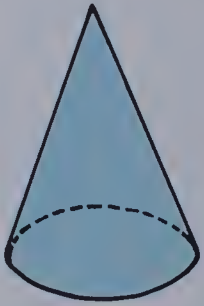

cylinder


square pyramid

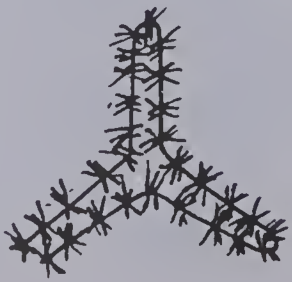

triangular prism

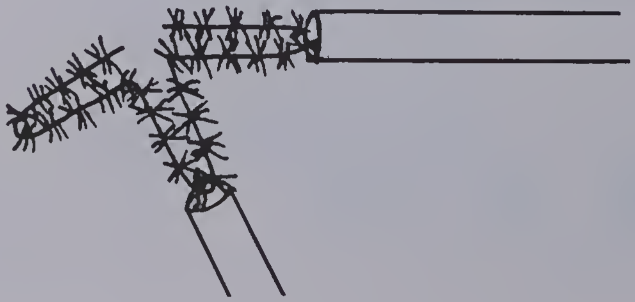

cube

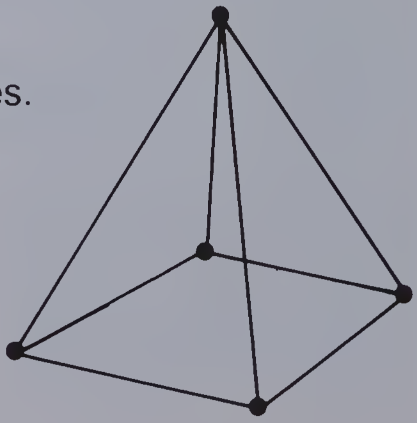

triangular pyramid


cone

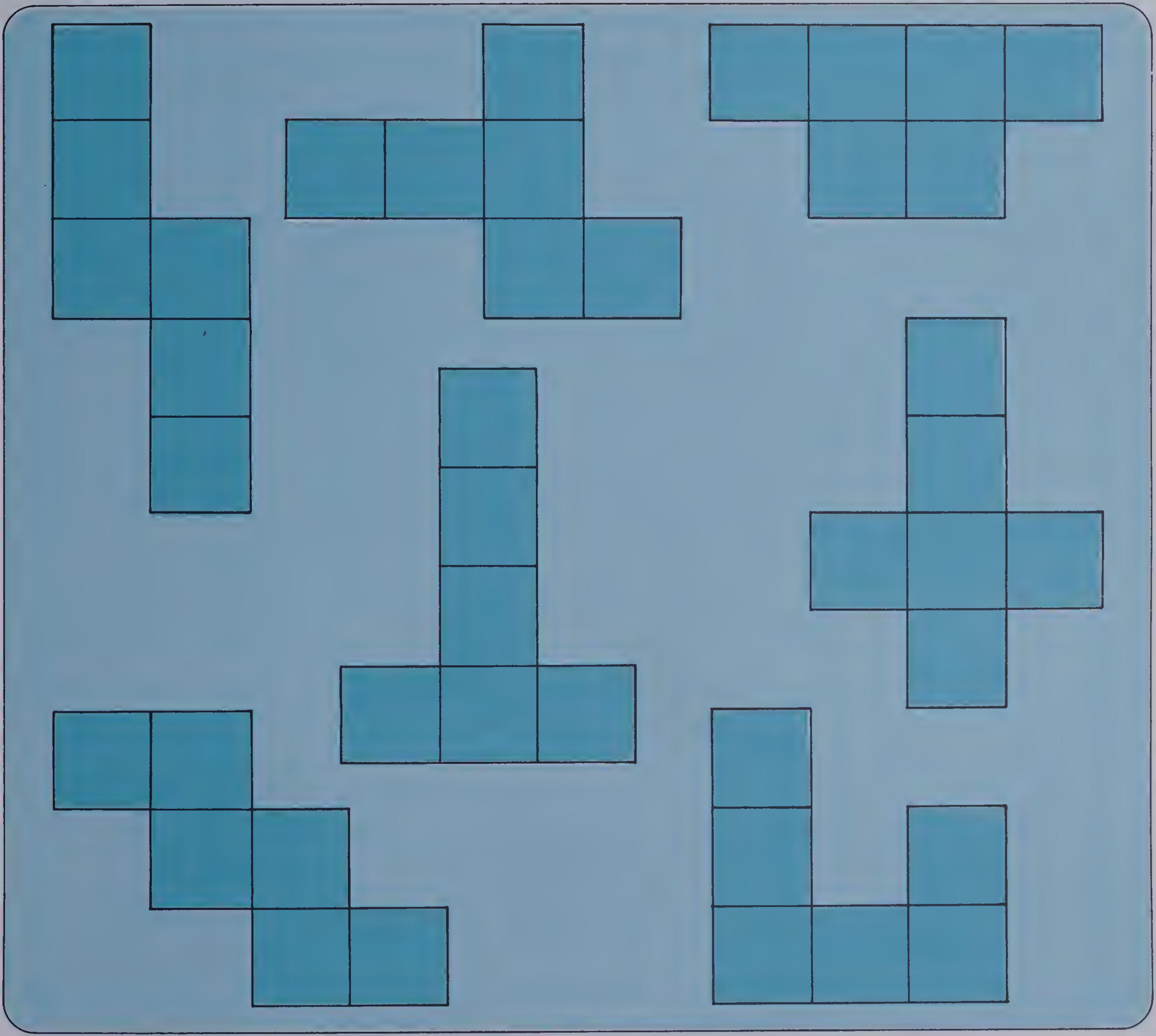
3. Use straws to build **skeletons** of 2 models.
Name the models you choose.
You can use pipe cleaners to hinge the vertices.





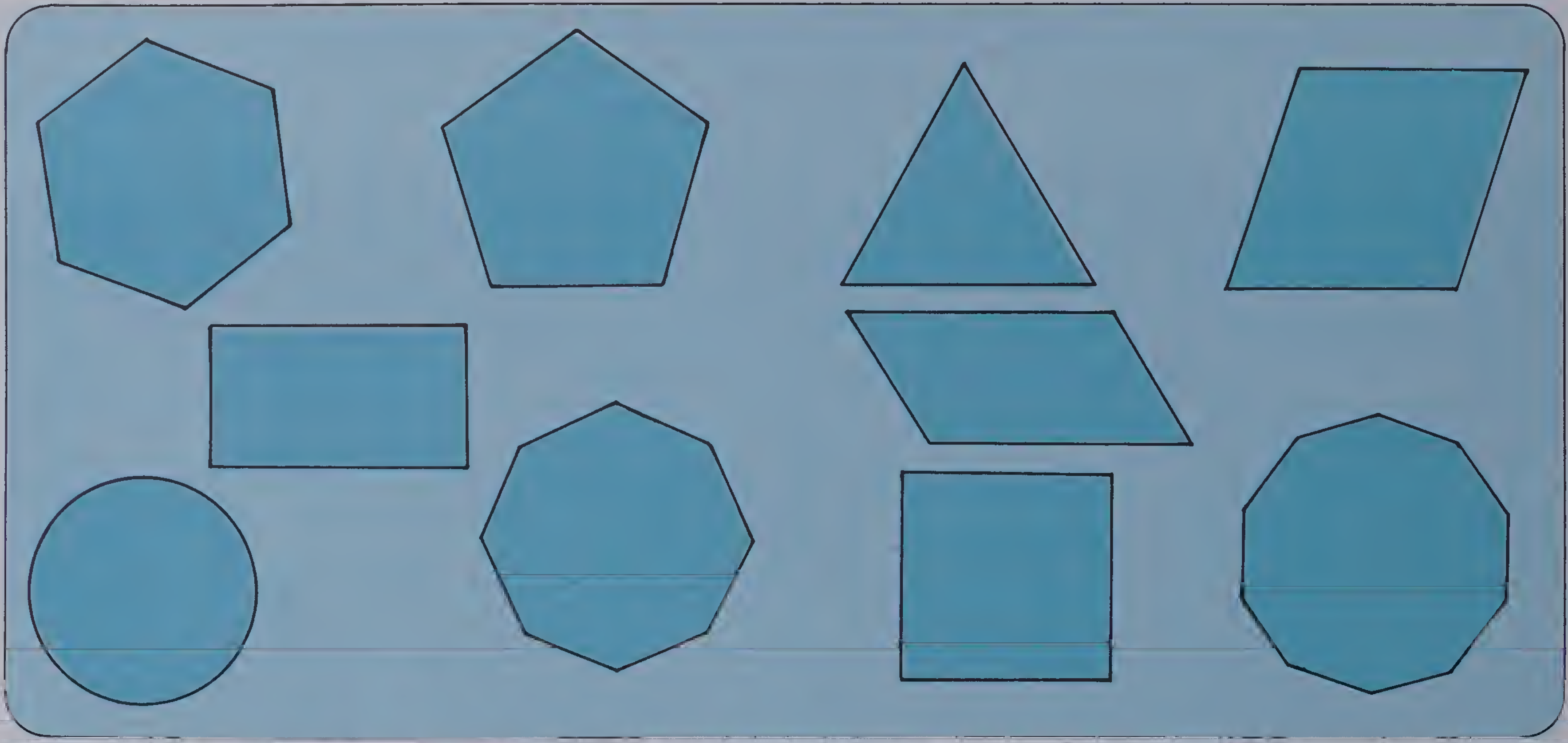


4. Which of these patterns can you use to create a cube? Check by tracing, cutting out, and folding each pattern.



EXPLORE

Geometric Shapes



Use a set of shapes like these.
You might like to make your own.
You could trace and cut out the ones above.

Examine the shapes carefully.
Name as many as you can.

How are these shapes sorted?

octagon
hexagon
circle
pentagon
triangle

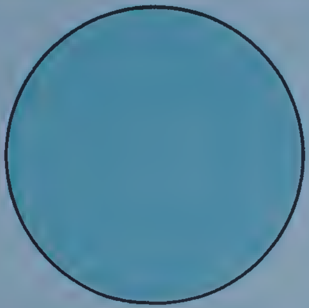
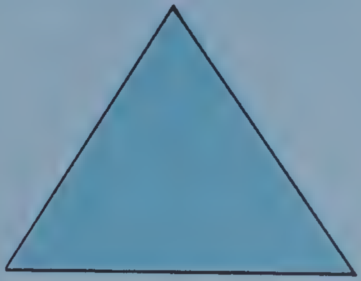
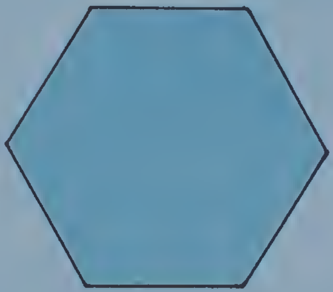
rectangle
parallelogram
rhombus
square

List other ways of sorting the shapes.

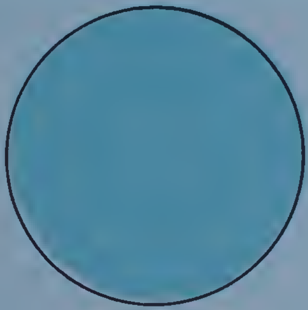
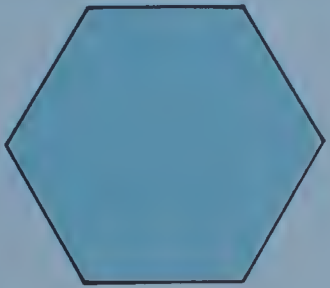
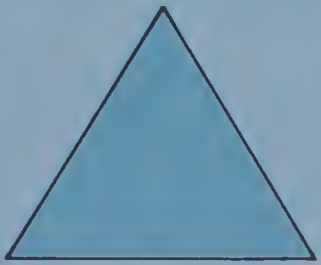
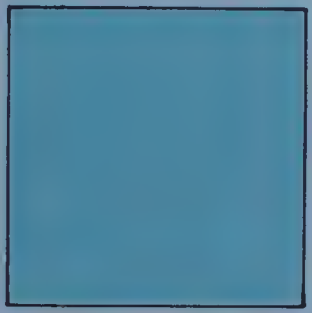
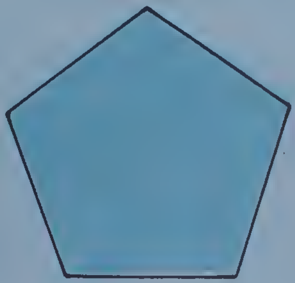
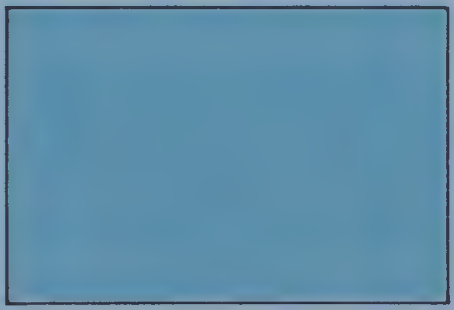
Sort the shapes into 2 different groups.
Make 2 lists. Ask a friend to tell you how you sorted them.

IN ACTION

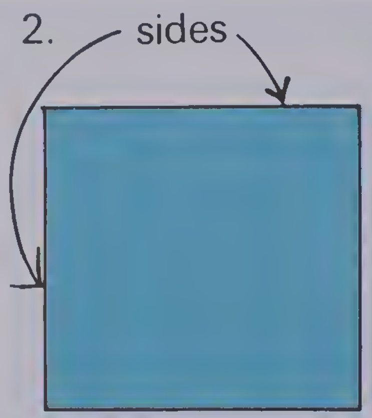
1. What objects in real life are like geometric shapes?
   a) List some ways Nature shows each of these.

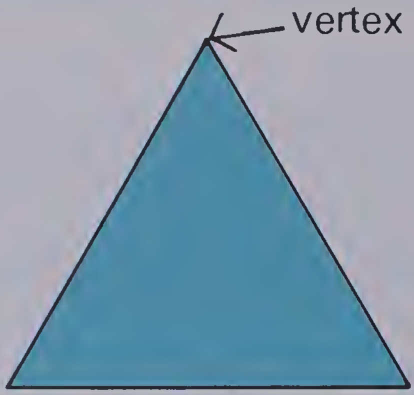
 circle	 triangle	 hexagon

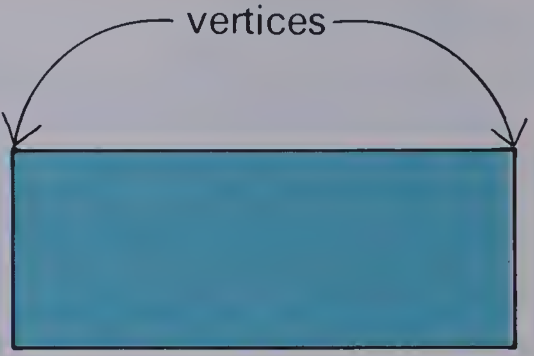
   b) List some ways we use each of these.

 circle	 hexagon	 triangle
 square	 pentagon	 rectangle

2.







Make a chart like this in your notebook.
A set of shapes will help you.

Shape	Number of sides	Number of vertices	Related model
Triangle	3	3	triangular prism triangular pyramid
Rhombus			
Rectangle			
Parallelogram			
Square			
Octagon			
Circle			
Hexagon			
Pentagon			

3. a) I have 4 sides
all the same length.
None of my 4 corners
are square.
What am I?

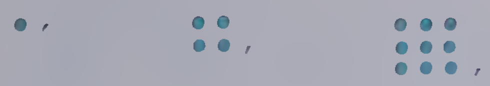
b) I have no vertices
and no sides.
What am I?

c) Create 2 riddles
of your own.
Give them to a friend
to solve.

Thinking About Patterns

Continue each pattern.

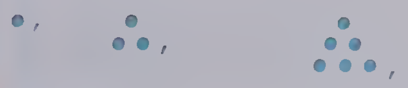
1, 4, 9, 16, ?, ?


?, ?, ?

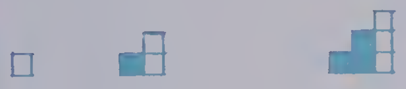
1, 1 + 3, 1 + 3 + 5, ?, ?, ?

1 × 1, 2 × 2, 3 × 3, ?, ?, ?

1, 3, 6, 10, ?, ?


?, ?, ?

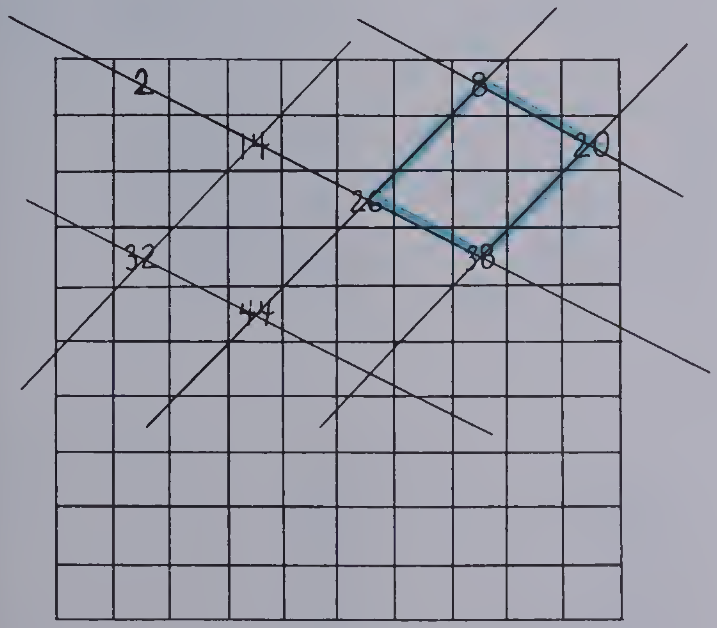
1, 1 + 2, 1 + 2 + 3, ?, ?, ?


?, ?, ?

Create a Pattern

a) Begin with an **odd** number, for example, 5. Choose another odd number for the **difference** between numbers in your pattern, for example, 3. Write the first 7 numerals in your pattern, for example
5, 8, 11, 14, 17, 20, 23, . . .

b) Begin with an **even** number, for example, 6. Choose another even number for the **difference** between numbers in your pattern, for example, 4. Write the first 8 numerals in your pattern, for example
6, 10, 14, 18, 22, 26, 30, 34, . . .



10 by 10 chart

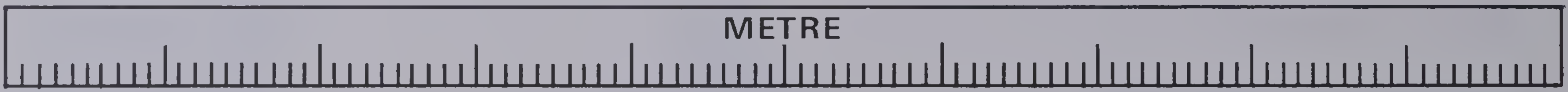
Think about the pattern
2, 8, 14, 20, 26, . . .

What is the difference between each number and the next? Write the numerals in the correct places in a 10 by 10 chart. Use a ruler to draw diagonals joining the squares, as in the picture. Trace the lines from 8 to 20 to 38 to 26 to 8. What is the figure?

Create a different pattern on a 10 by 10 chart.

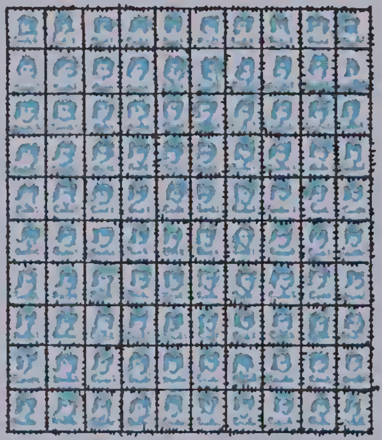
Hundredths

1 m = 100 cm

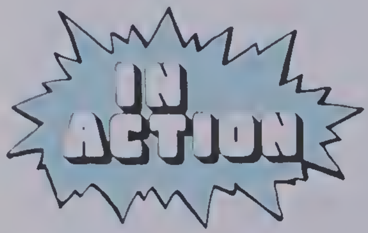


The picture represents 1 m (metre).

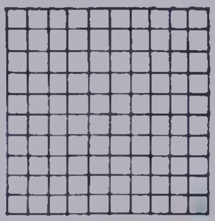
100 equal parts each part shows $\frac{1}{100}$

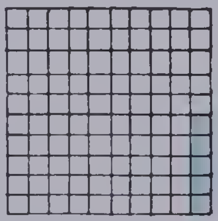


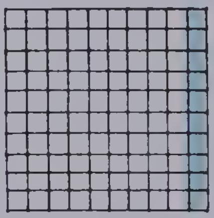
1 sheet of stamps
100 equal parts
each part shows $\frac{1}{100}$

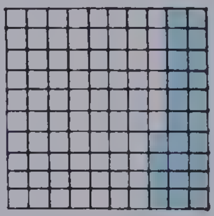


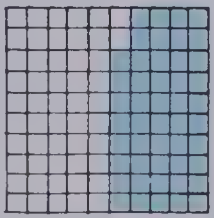
1. What fractions are represented?

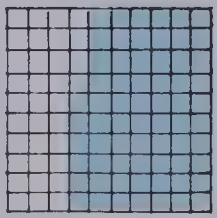
a)


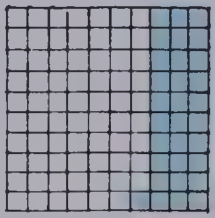
b)


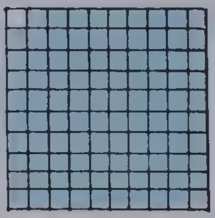
c)


d)


e)


f)


g)


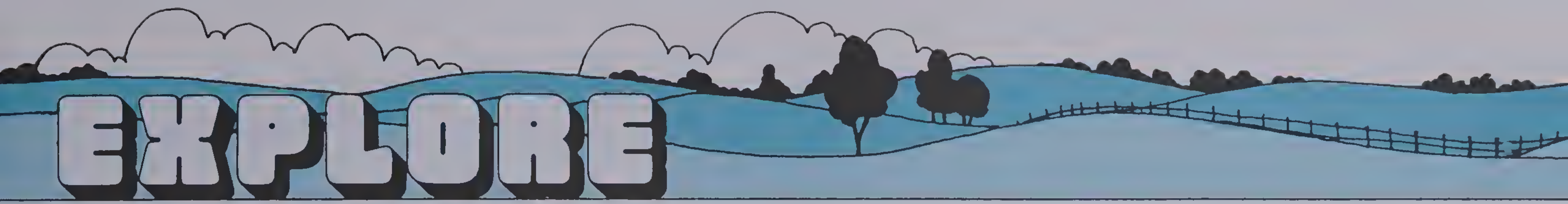
h)


2. Use graph paper (10 cm by 10 cm) to show each fraction.

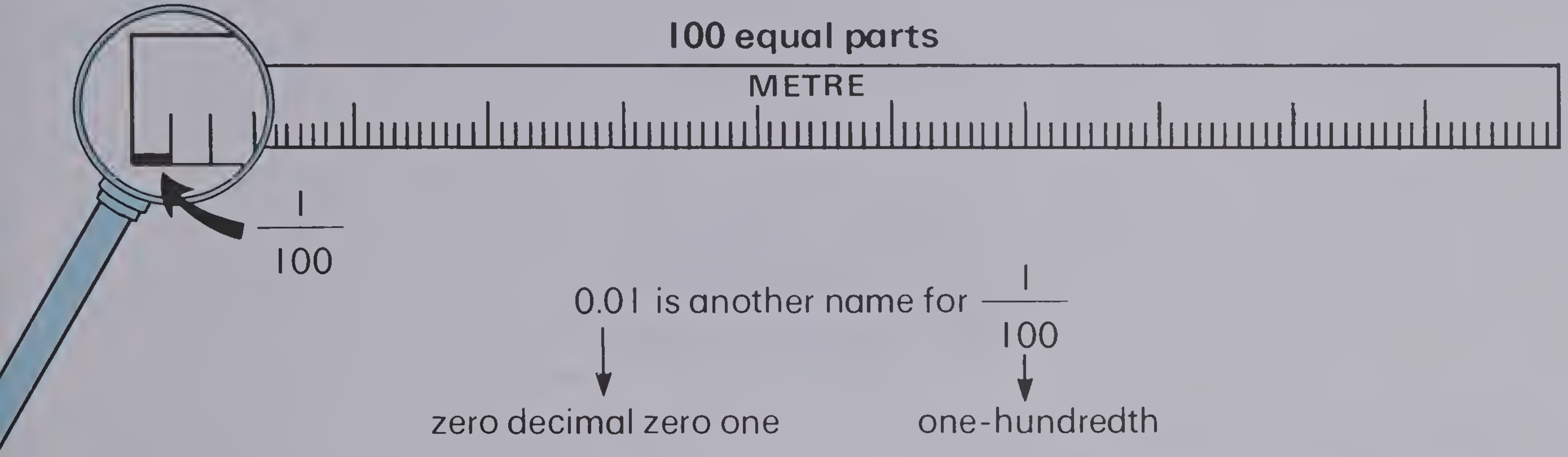
a) $\frac{7}{100}$ b) $\frac{10}{100}$ c) $\frac{22}{100}$ d) $\frac{35}{100}$ e) $\frac{43}{100}$ f) $\frac{19}{100}$

g) $\frac{84}{100}$ h) $\frac{70}{100}$ i) $\frac{11}{100}$ j) $\frac{50}{100}$ k) $\frac{75}{100}$ l) $\frac{3}{100}$

EXPLORE



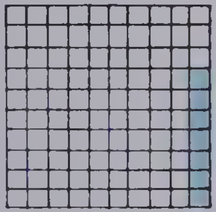
Decimals 0.01 to 0.99


100 equal parts
METRE
1/100

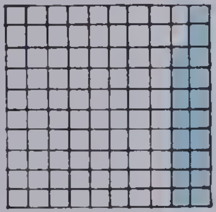
0.01 is another name for $\frac{1}{100}$

0.01 → zero decimal zero one

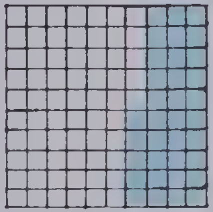
$\frac{1}{100}$ → one-hundredth



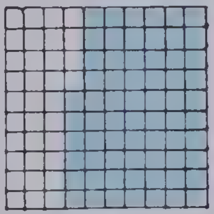
0.07



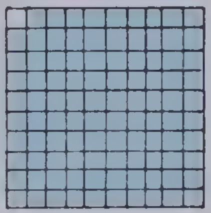
0.18



0.35



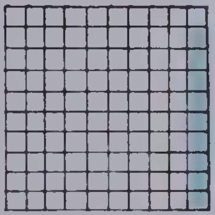
0.66

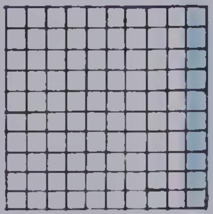


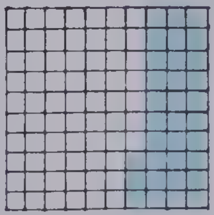
0.99

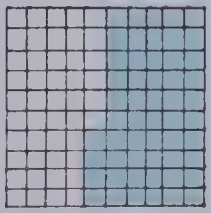
IN ACTION

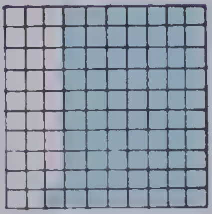
1. What decimals are represented?

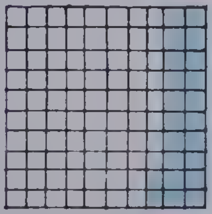
a) 

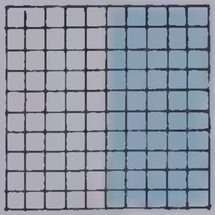
b) 

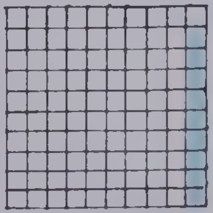
c) 

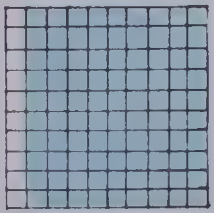
d) 

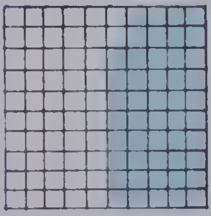
e) 

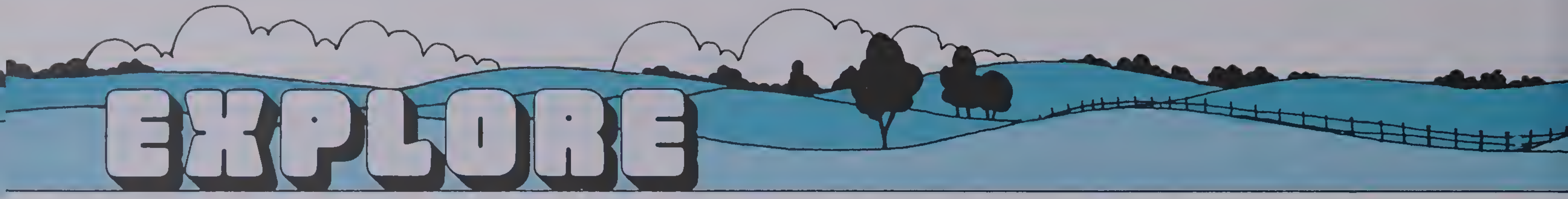
f) 

g) 

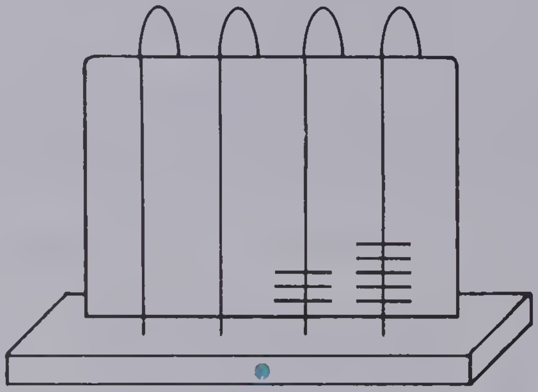
h) 

i) 

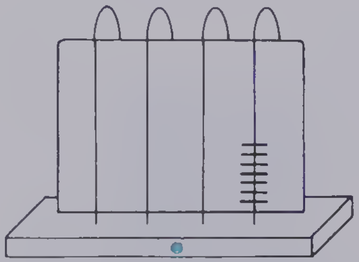
j) 



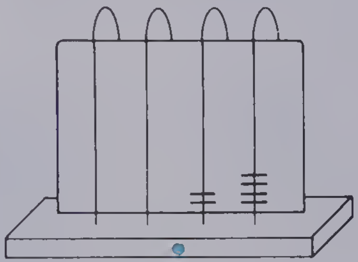
Representing Hundredths



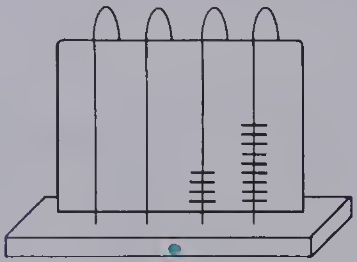
0.35



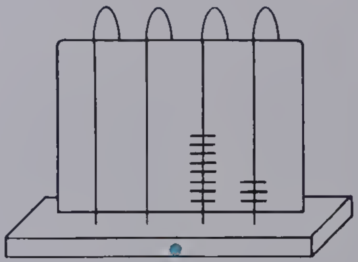
0.07



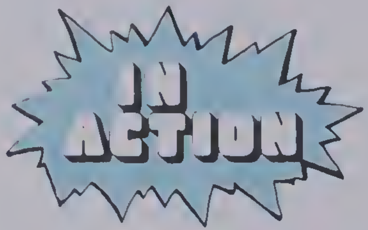
0.24



0.49

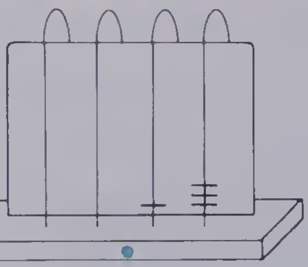


0.83

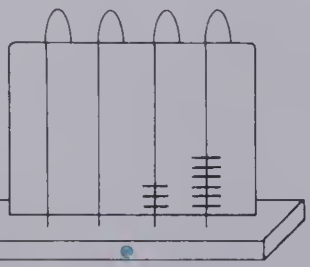


1. What decimals are represented?

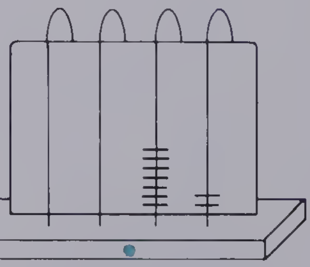
a)



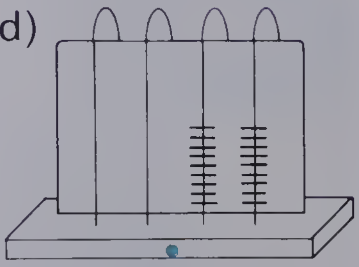
b)



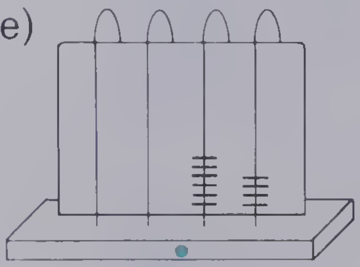
c)



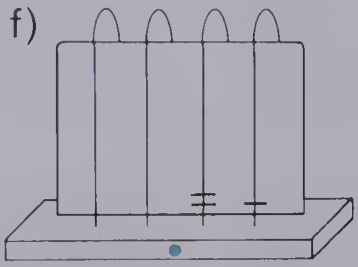
d)



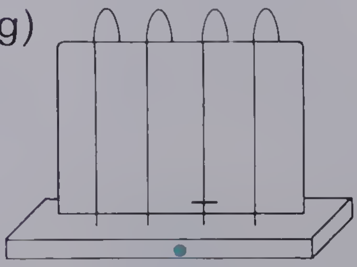
e)



f)



g)



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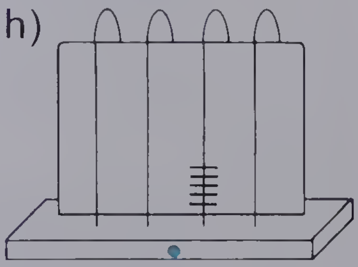
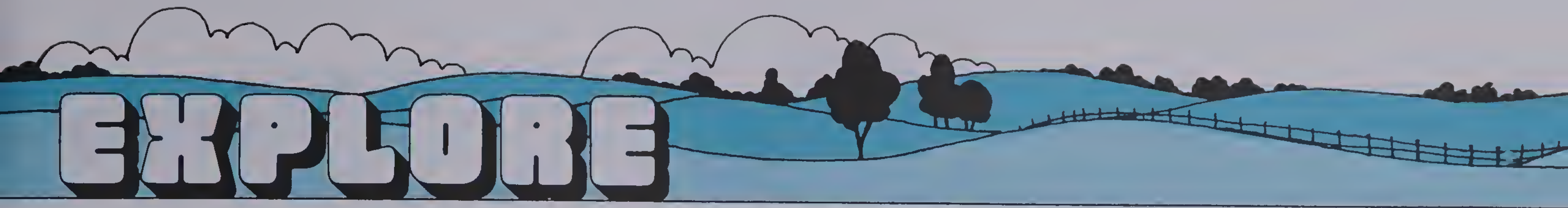
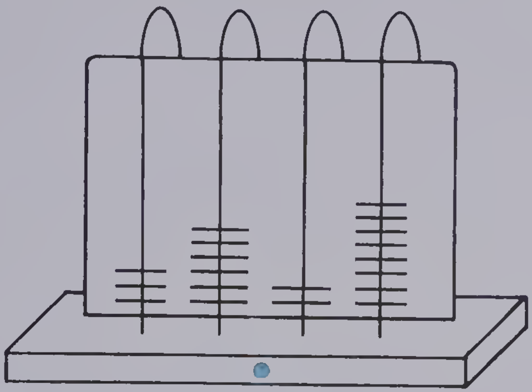


2. Sketch an abacus to show each decimal.

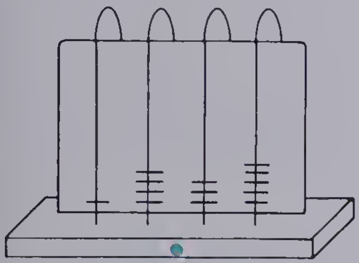
a) 0.48 b) 0.85 c) 0.17 d) 0.06 e) 0.2 f) 0.78 g) 0.3 h) 0.91



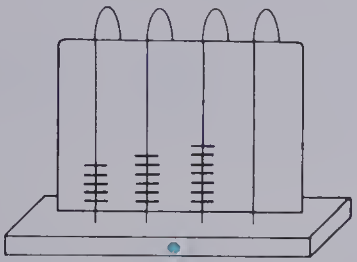
Tens to Hundredths



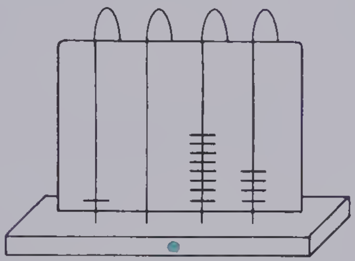
3 6.2 8



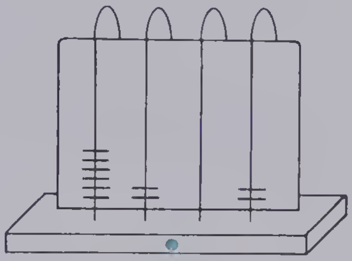
1 4.3 5



5 6.7



1 0.8 4

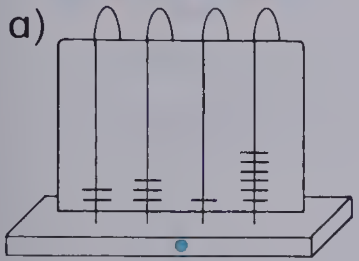


6 2.0 2

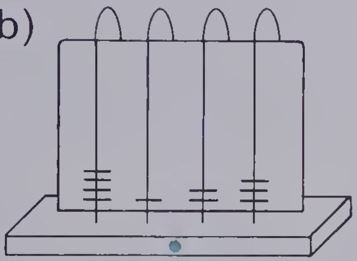
IN ACTION

1. What numbers are represented?

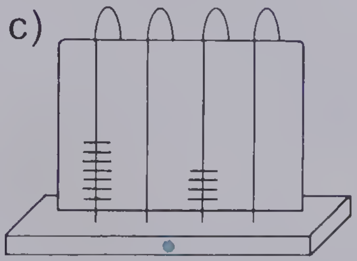
a)



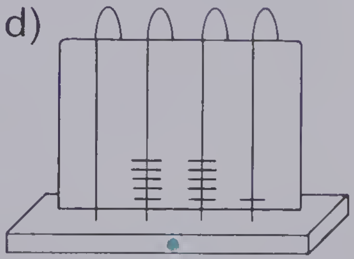
b)



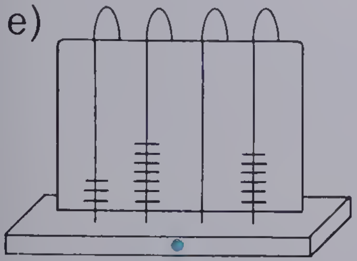
c)



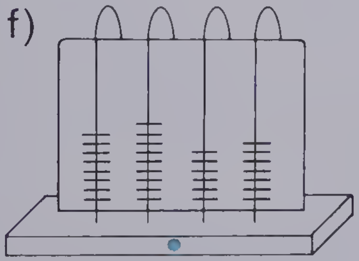
d)



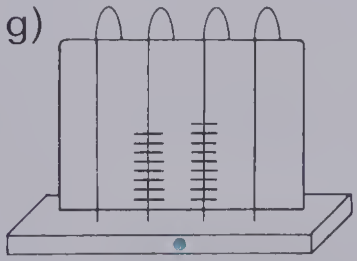
e)



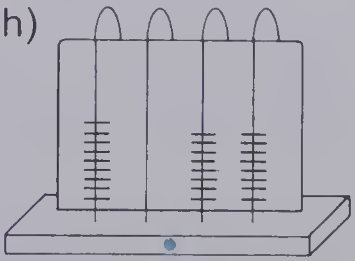
f)



g)



h)



2. Sketch an abacus to show each number.

a) 12.32 b) 54.7 c) 66.73 d) 1.04 e) 20.15 f) 45.91 g) 0.66

EXPLORE

The Meaning Depends on the Place

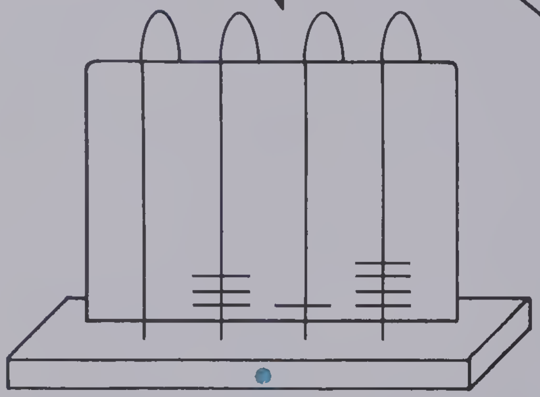
3.14 → 3 ONES, 1 TENTH and 4 HUNDREDTHS

meaning

read as "three decimal one four"

3 + 0.1 + 0.04

expanded form



abacus

ONES	TENTHS	HUNDREDTHS
3	1	4

place value chart

Use the same ways to explain 6.25.

IN ACTION

What numbers are represented?

1. a) 7 ones, 8 tenths, and 8 hundredths
b) 3 ones, 0 tenths, and 9 hundredths
c) 5 ones, 4 tenths, and 6 hundredths
d) 2 ones, 5 tenths, and 0 hundredths
e) 8 ones, 7 tenths, and 2 hundredths
f) 4 ones, 8 tenths, and 4 hundredths
g) 9 ones, 3 tenths, and 5 hundredths
h) 6 ones, 0 tenths, and 7 hundredths

2. a)

ONES	TENTHS	HUNDREDTHS
1	8	3

b)

ONES	TENTHS	HUNDREDTHS
7	3	9

c)

ONES	TENTHS	HUNDREDTHS
3	7	0

d)

ONES	TENTHS	HUNDREDTHS
5	0	8

e)

ONES	TENTHS	HUNDREDTHS
8	1	7

f)

1	0.1	0.01
2	5	0

g)

1	0.1	0.01
6	1	5

h)

1	0.1	0.01
4	9	0

i)

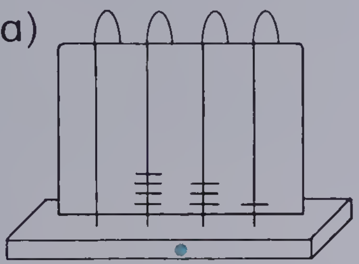
1	0.1	0.01
7	9	4

j)

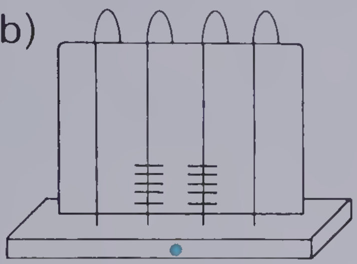
1	0.1	0.01
1	0	4

3. a) 9 + 0.6 + 0.04 b) 1 + 0.3 + 0.01 c) 7 + 0.5 + 0.01 d) 3 + 0.1 + 0.05
e) 5 + 0.2 + 0.02 f) 8 + 0.4 + 0.00 g) 2 + 0.2 + 0.06 h) 4 + 0.0 + 0.03
i) 6 + 0.6 + 0.03 j) 9 + 0.0 + 0.03 k) 1 + 0.9 + 0.00 l) 5 + 0.4 + 0.06

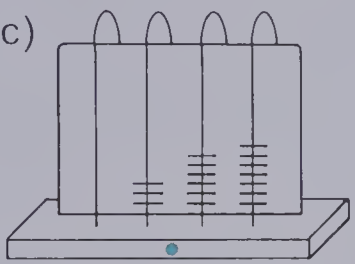
4. a)



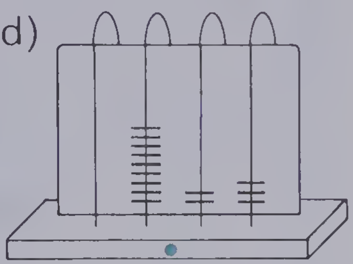
b)



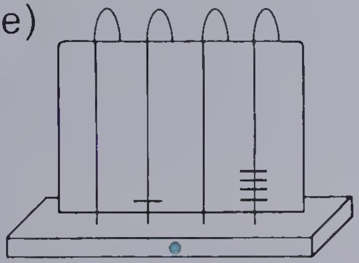
c)



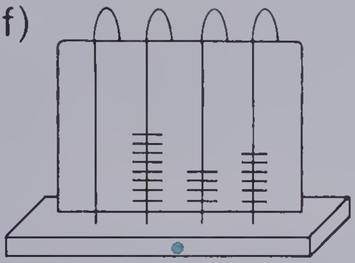
d)



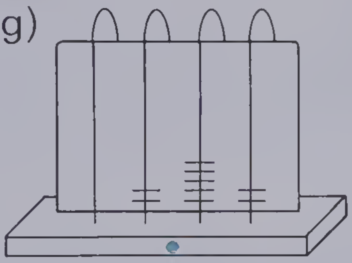
e)



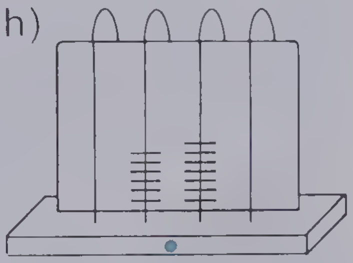
f)



g)



h)



Use the method suggested to explain the numbers.

5. The Meaning
a) 1.72 b) 3.91 c) 5.83 d) 7.12 e) 9.41 f) 8.33 g) 6.29
h) 4.70 i) 2.04 j) 1.65 k) 9.12 l) 2.37 m) 8.60 n) 3.04

6. Expanded Form
a) 7.23 b) 4.56 c) 6.90 d) 5.91 e) 9.08 f) 5.74 g) 8.05
h) 4.27 i) 7.60 j) 3.53 k) 6.38 l) 2.19 m) 5.05 n) 1.90

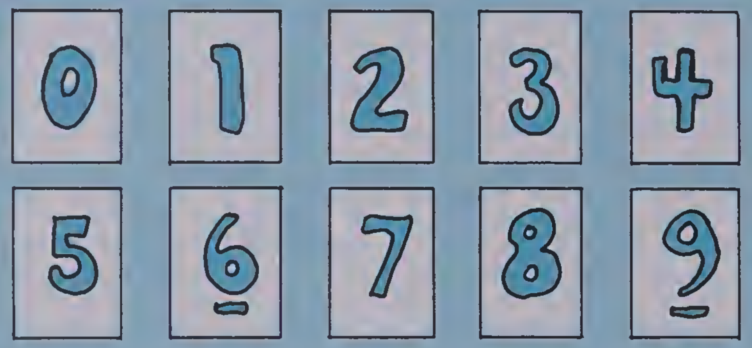
7. Place Value Chart
a) 1.56 b) 5.60 c) 2.65 d) 6.04 e) 3.82 f) 7.45 g) 4.02
h) 8.21 i) 6.46 j) 9.70 k) 4.65 l) 8.54 m) 2.70 n) 9.56

8. An Abacus
a) 9.56 b) 8.72 c) 5.29 d) 3.67 e) 7.06 f) 6.81 g) 4.08
h) 7.15 i) 1.51 j) 6.9 k) 5.34 l) 2.26 m) 4.43 n) 3.4

9. What is the meaning of each coloured digit?
a) 1.84 b) 9.23 c) 3.67 d) 7.54 e) 2.20 f) 8.12 g) 4.41
h) 6.75 i) 5.09 j) 2.43 k) 7.31 l) 5.38 m) 1.08 n) 3.75
o) 9.84 p) 6.82 q) 4.90 r) 8.46 s) 7.08 t) 3.77 u) 2.33

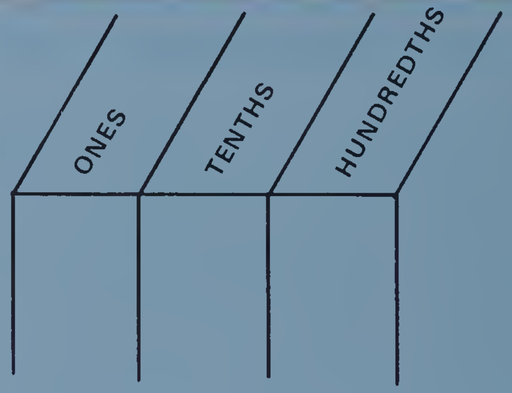
Least Number (3 to 6 players)

A


0
1
2
3
4
5
6
7
8
9

Make a deck of cards like this.

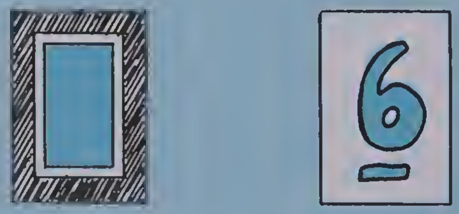
B


ONES
TENTHS
HUNDREDTHS

Each player makes a place value chart like this.

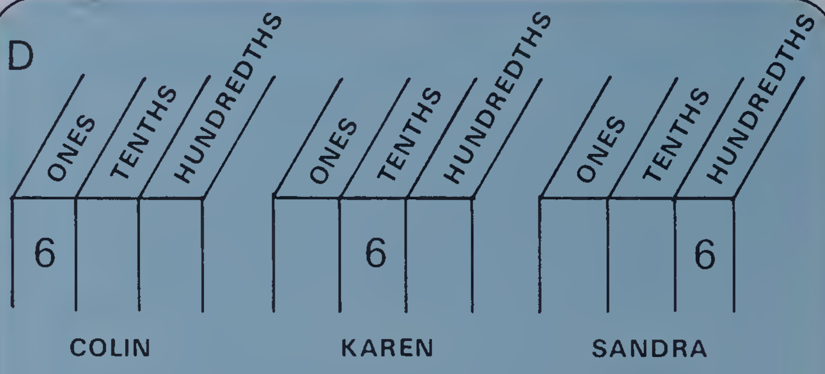
C

Shuffle the cards and place the deck face down.



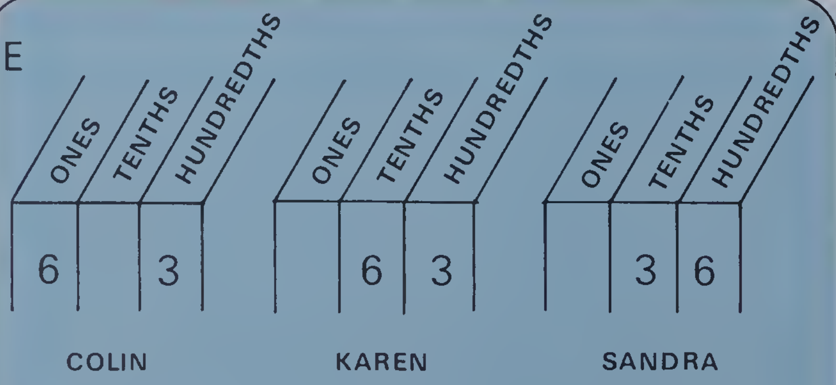
The first player draws a card and places it face up beside the deck. The players write the numerals in their charts.

D


ONES
TENTHS
HUNDREDTHS
6
COLIN
ONES
TENTHS
HUNDREDTHS
6
KAREN
ONES
TENTHS
HUNDREDTHS
6
SANDRA

In this round, 3 different players wrote the 6 in these places.

E


ONES
TENTHS
HUNDREDTHS
6
3
COLIN
ONES
TENTHS
HUNDREDTHS
6
3
KAREN
ONES
TENTHS
HUNDREDTHS
3
6
SANDRA

The second card was a 3.

F

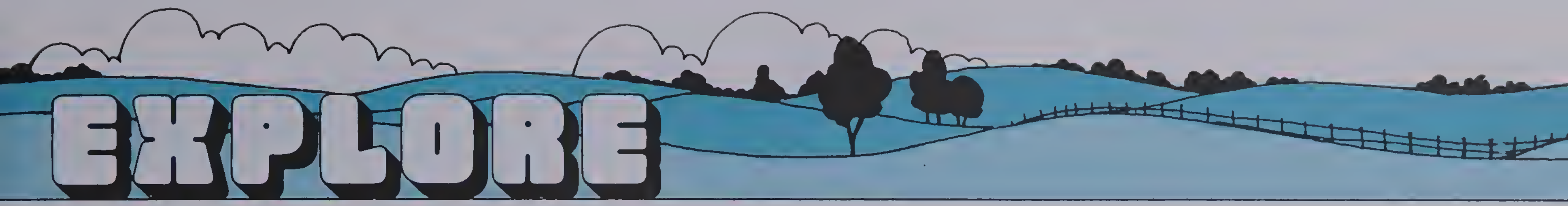
The third card was a 9.

What were the 3 numbers?

Who had the **Least Number**?

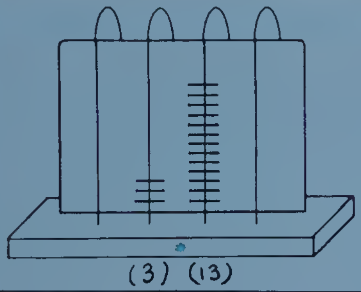
Play this game yourself.

EXPLORE



Regrouping / Ones and Tenths

Exchanging 10 for 1



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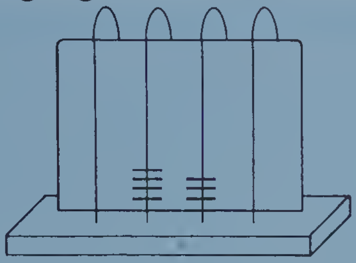
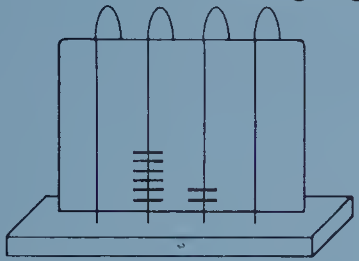


OR 4.3

Exchanging 1 for 10

6.2 OR



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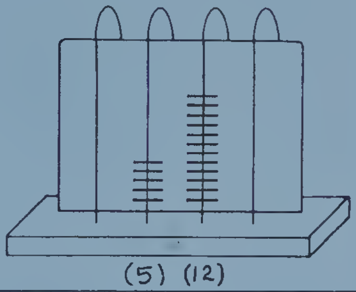


4 + 1.7 OR 5 + 0.7 OR 5.7

8.2 OR 8 + 0.2 OR 7 + 1.2

IN ACTION

Regroup. Exchange 10 for 1 or 1 for 10.

a) 1 + 1.7 = 2 + 0.7 = 2.7

b) 5.4 = 5 + 0.4 = 4 + 1.4

c) 2 + 1.1 = 3 + 0.1 = ?

d) 7.8 = 7 + 0.8 = 6 + ?

e) 0 + 1.6 = 1 + ? = 1.6

f) 9.2 = 9 + ? = 8 + 1.2

g) 5 + ? = 6 + 0.9 = 6.9

h) ? = 8 + 0.3 = 7 + 1.3

i) 3 + 1.5 = 4 + ? = 4.5

j) 3.4 = ? + 0.4 = 2 + 1.4

k) 4 + ? = 5 + 0.5 = 5.5

l) 9.2 = 9 + ? = 8 + 1.2

m) 1 + 1.1 = 2 + 0.1 = ?

n) 7.4 = 7 + 0.4 = ? + 1.4

o) ? + 1.9 = 1 + 0.9 = 1.9

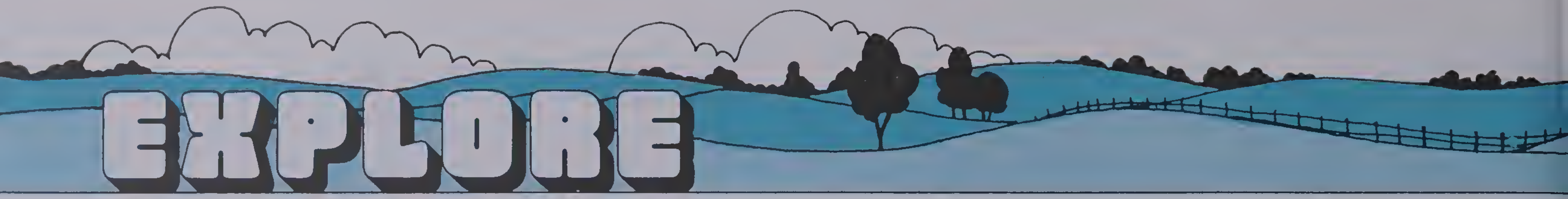
p) ? = 6 + 0.8 = 5 + 1.8

q) 7 + 1.7 = ? = 8.7

r) 3.4 = ? = 2 + 1.4

s) ? = 4 + 0.6 = 4.6

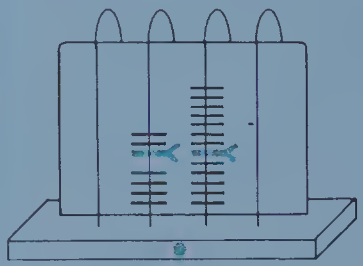
t) 9.3 = 9 + 0.3 = ?



Addition / 1 Decimal / Regrouping

A

ADD.
4.5
2.7



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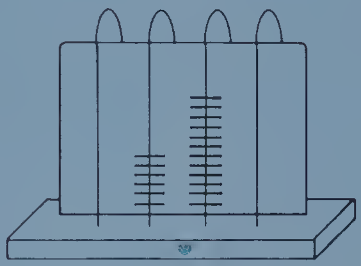

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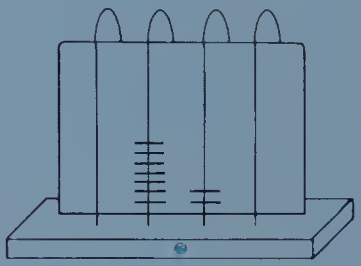


B
4.5 = 4 and 5 tenths
2.7 = 2 and 7 tenths
6 and 12 tenths
= 7 and 2 tenths

C
4.5
2.7
1.2
6.0
7.2

D
4.5 ↑
2.7
7.2

Think	Record
12	2
3,7	7

IN ACTION

1. Add this way.
3.7 = 3 and 7 tenths
1.8 = 1 and 8 tenths
4 and 15 tenths
= 5 and 5 tenths

a) 1.1 6.9	b) 3.9 2.6	c) 4.2 3.8	d) 5.8 2.5	e) 7.3 1.8	f) 6.7 0.5	g) 2.4 4.7
h) 3.6 5.6	i) 5.5 2.8	j) 6.1 1.9	k) 1.8 7.4	l) 4.2 3.9	m) 7.9 0.3	n) 2.7 4.5

2. Add this way.
3.7
1.8
1.5
4.0
5.5

a) 6.9 2.7	b) 4.5 3.9	c) 2.6 5.8	d) 0.3 7.9	e) 3.8 4.2
f) 7.4 2.8	g) 1.8 6.7	h) 0.5 6.7	i) 5.6 1.8	j) 4.7 5.5

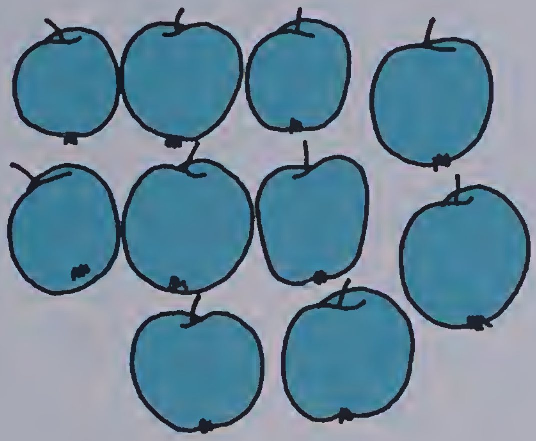
3. Add this way.

$$\begin{array}{r} 3.7 \\ \underline{1.8} \uparrow \\ 5.5 \end{array}$$

a)	b)	c)	d)	e)	f)	g)
2.7	8.2	4.5	2.4	5.8	4.7	3.8
1.9	0.9	3.6	6.9	3.9	3.6	2.6

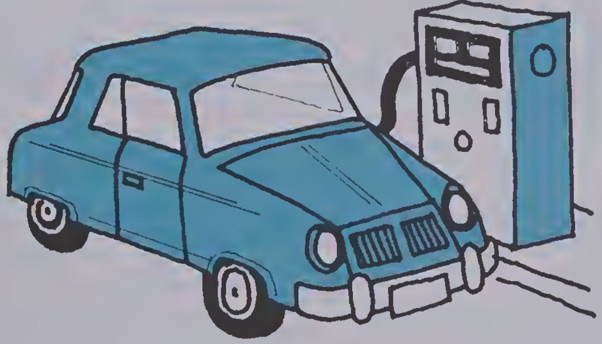
h)	i)	j)	k)	l)	m)	n)
1.8	5.3	0.5	7.4	6.7	0.3	2.5
5.6	1.8	7.9	1.7	2.4	6.7	3.9

4. At the 07:00 milking, Winston's prize-winning Jersey cow gave 3.9 ℓ of milk. At the 17:00 milking, she gave 4.5 ℓ of milk. How much milk did the Jersey give that day?

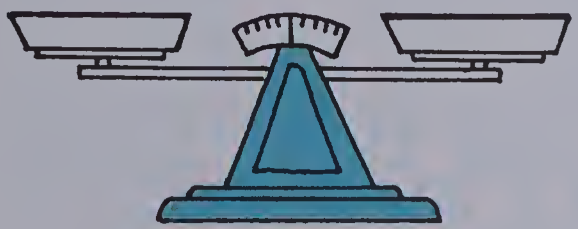


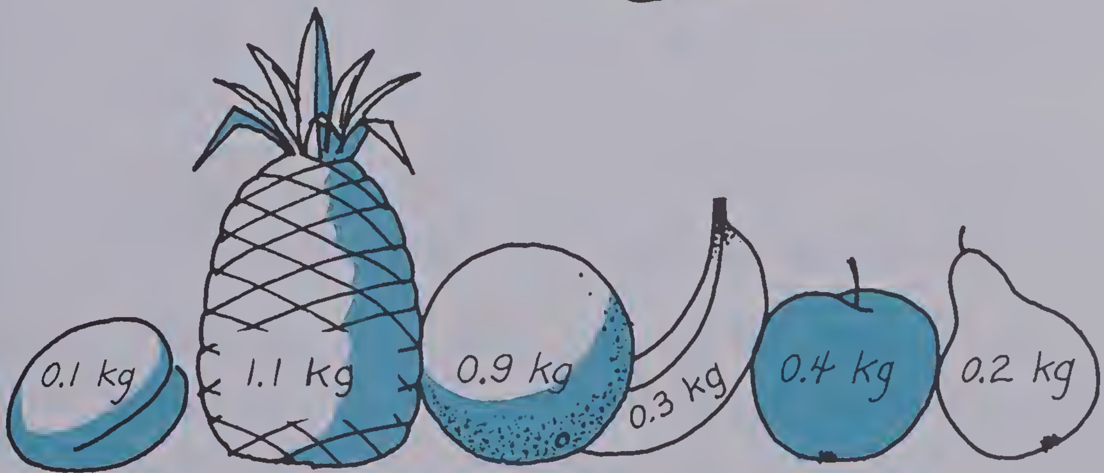
5. Greta and Nan picked apples from their grandparents' orchard. Greta's apples had a mass of 14.6 kg and Nan's had a mass of 13.7 kg. What was the total mass of the apples?

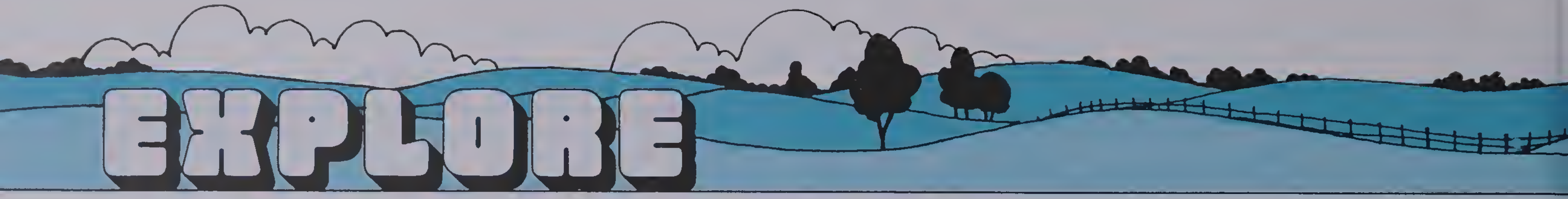
6. One week the family's car used 43.7 ℓ of gasoline. The next week it used 42.9 ℓ of gasoline. How much gasoline did the car use during the 2 weeks?



7. How could you balance this set of scales?





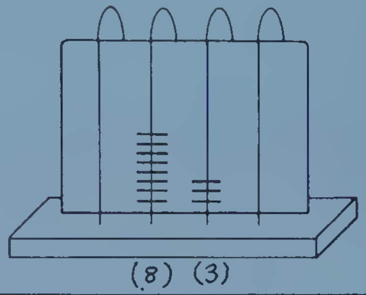


Subtraction / 1 Decimal / Regrouping

A

SUBTRACT.

8.3
3.7



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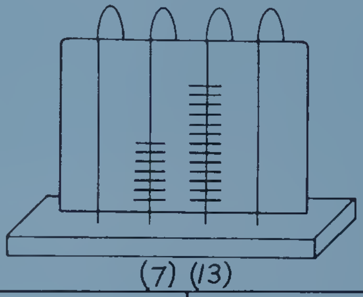

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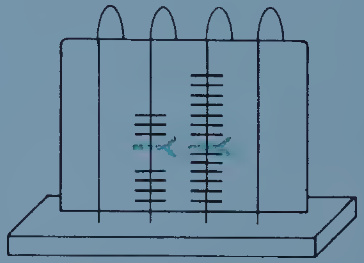


B

8.3	=	7 and 13 tenths
3.7	=	3 and 7 tenths
		4 and 6 tenths

C

8.3
3.7
4.6

Think	Record
13, 6	6
7, 4	4

IN ACTION

1. Subtract this way.

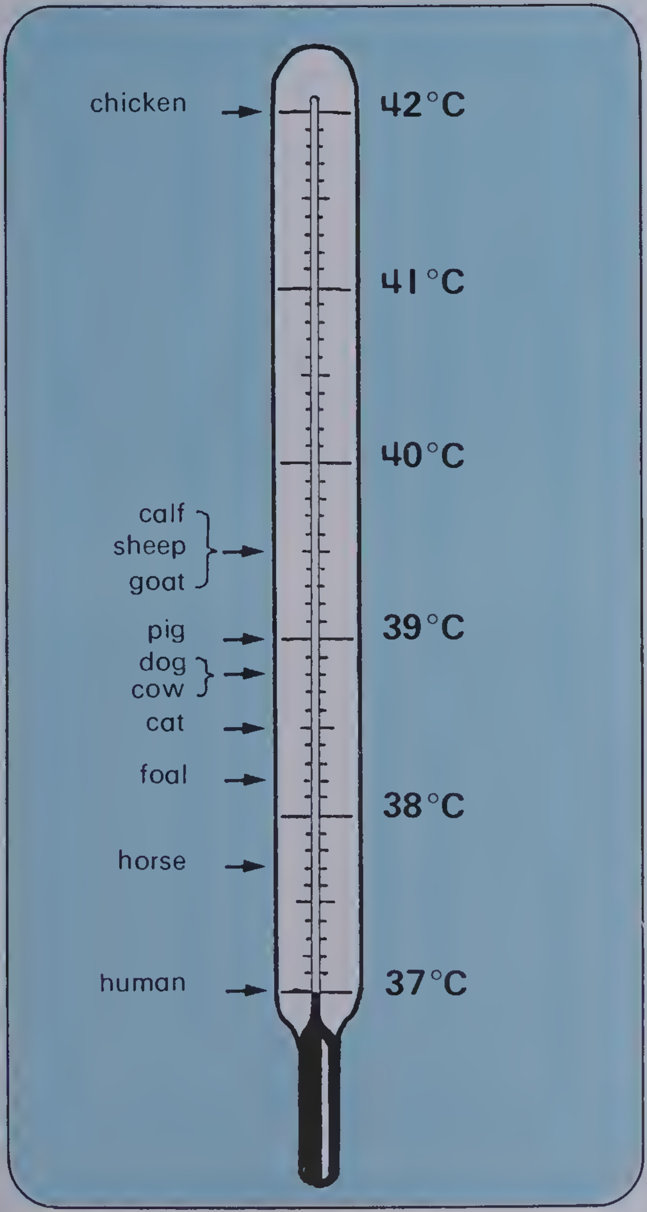
4.6	=	3 and 16 tenths
1.9	=	1 and 9 tenths
		2 and 7 tenths

a)	b)	c)	d)	e)	f)	g)
3.2	6.5	9.8	7.7	4.4	1.1	2.3
1.3	2.7	6.9	4.8	1.6	0.4	1.5
h)	i)	j)	k)	l)	m)	n)
5.6	8.8	9.5	5.2	8.1	4.3	4.5
2.9	7.9	5.7	3.4	2.2	3.5	2.8
o)	p)	q)	r)	s)	t)	u)
3.6	6.4	2.3	5.5	6.1	9.5	7.0
1.7	4.6	0.5	3.6	2.3	6.6	4.1

2. Subtract this way.

$$\begin{array}{r} 4.6 \\ 1.9\downarrow \\ \hline 2.7 \end{array}$$

a) 4.1 2.3	b) 2.7 0.8	c) 6.6 4.7	d) 6.8 3.9	e) 4.6 2.9	f) 4.8 1.9	g) 3.5 2.8
h) 7.4 1.5	i) 3.4 1.7	j) 7.2 4.5	k) 5.7 3.8	l) 9.5 3.9	m) 6.4 4.7	n) 8.1 0.6
o) 5.6 3.7	p) 7.7 2.8	q) 5.2 1.4	r) 4.0 2.1	s) 4.1 3.2	t) 5.5 2.6	u) 7.0 5.3



Normal Body Temperatures

3. a) Which animal has the lowest body temperature? Which has the highest?
   b) What is the difference between the temperatures?

4. What is the difference between a dog's and a cat's body temperature?

5. What is the difference between a pig's and a sheep's body temperature?

6. By how many degrees does a horse's body temperature differ from a foal's?

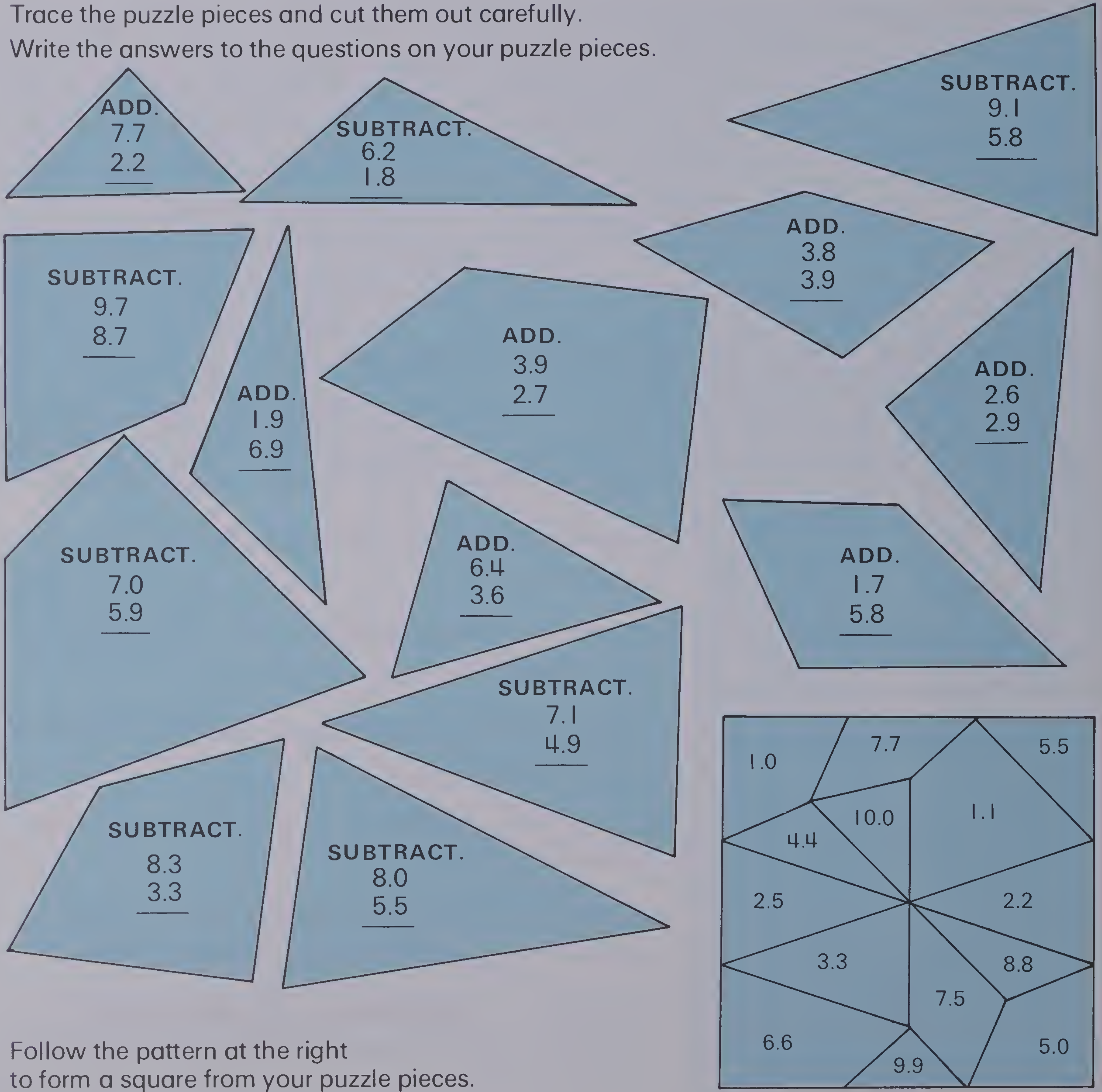
7. By how many degrees does a cow's body temperature differ from a calf's?

8. a) Which is the smallest animal? Which is the largest?
   b) By how much do their body temperatures differ?

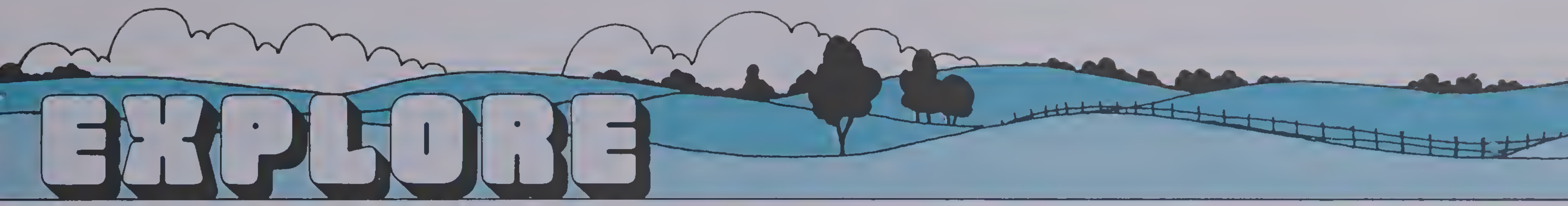
9. a) Which of the animals listed is your favourite?
   b) What is the difference between its body temperature and yours?

Jigsaw Puzzle

Trace the puzzle pieces and cut them out carefully.
Write the answers to the questions on your puzzle pieces.


ADD.
7.7
2.2
SUBTRACT.
6.2
1.8
SUBTRACT.
9.1
5.8
ADD.
3.8
3.9
SUBTRACT.
9.7
8.7
ADD.
1.9
6.9
ADD.
3.9
2.7
ADD.
2.6
2.9
SUBTRACT.
7.0
5.9
ADD.
6.4
3.6
ADD.
1.7
5.8
SUBTRACT.
7.1
4.9
SUBTRACT.
8.3
3.3
SUBTRACT.
8.0
5.5
1.0
7.7
5.5
10.0
1.1
4.4
2.5
2.2
3.3
8.8
7.5
6.6
9.9
5.0

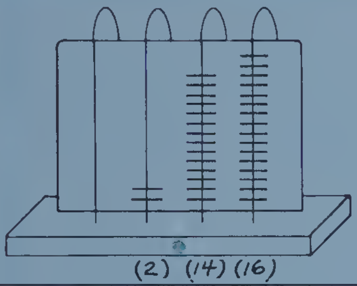
Follow the pattern at the right
to form a square from your puzzle pieces.



EXPLORE

Regrouping / Tenths and Hundredths

Exchanging 10 for 1



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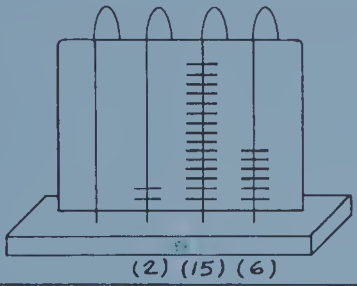
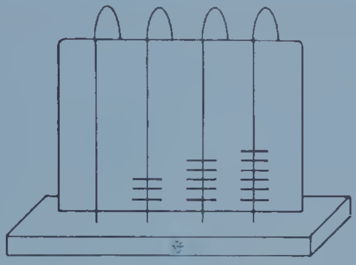


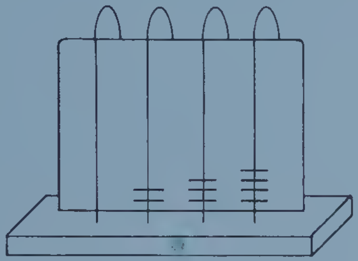
OR



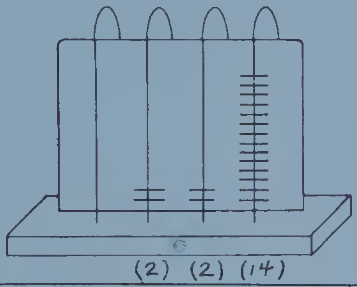
OR 3.56

Exchanging 1 for 10

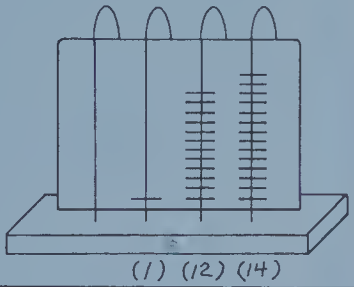
2.34 OR



OR



OR



3 + 1.60 + 0.12 OR 3 + 1.70 + ? OR 4 + 0.70 + 0.02 OR 4.72

6.47 OR 6 + 0.40 + ? OR 6 + 0.30 + 0.17 OR 5 + ? + 0.17

IN ACTION

Regroup. Exchange 10 for 1 or 1 for 10.

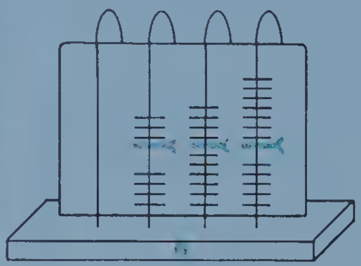
a) 8 + 1.20 + 0.17 = 8 + ? + 0.07 = 9 + 0.30 + 0.07 = ?
b) 6.56 = ? + 0.50 + 0.06 = 6 + ? + 0.16 = 5 + 1.40 + 0.16
c) 2 + 1.00 + 0.18 = 2 + 1.10 + ? = ? + 0.10 + 0.08 = 3.18
d) ? = 5 + 0.40 + 0.04 = 5 + 0.30 + ? = 4 + 1.30 + 0.14
e) 6 + 1.50 + 0.15 = ? + 1.60 + 0.05 = 7 + 0.60 + ? = 7.65
f) 4.89 = 4 + 0.80 + ? = 4 + 0.70 + 0.19 = 3 + ? + 0.19
g) 1 + ? + 0.11 = 1 + 1.20 + 0.01 = ? + 0.20 + 0.01 = ?

EXPLORE

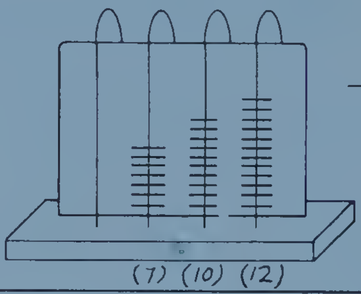
Addition / 2 Decimals / Regrouping

A

ADD.
4.65
3.47



OR



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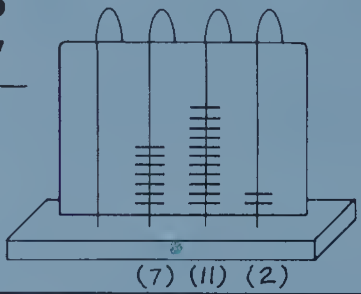
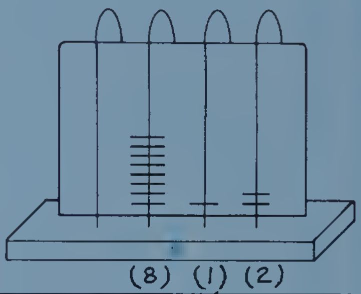


OR



B

4.65 = 4 and 6 tenths and 5 hundredths
3.47 = 3 and 4 tenths and 7 hundredths

7 and 10 tenths and 12 hundredths
= 7 and 11 tenths and 2 hundredths
= 8 and 1 tenth and 2 hundredths

C

4.65
3.47
0.12
1.00
7.00
8.12

D

4.65
3.47
8.12

Think	Record
12	2
5,11	1
4,8	8

IN ACTION

1. Add this way.

3.46
1.67
0.13
1.00
4.00
5.13

a) 5.89 + 2.42
b) 7.87 + 8.59
c) 0.69 + 6.64
d) 3.76 + 9.56
e) 6.95 + 4.47
f) 5.79 + 8.87
g) 1.67 + 5.53
h) 4.78 + 9.44
i) 2.37 + 6.84
j) 3.68 + 8.77
k) 3.68 + 7.55
l) 2.59 + 7.67
m) 7.62 + 8.48
n) 3.28 + 3.77
o) 0.86 + 1.95

2. Add this way.

$$\begin{array}{r}3.46\\ 1.67\\ \hline 5.13\end{array}\uparrow$$

a) $\begin{array}{r}9.28\\ 5.85\\ \hline\end{array}$ b) $\begin{array}{r}0.56\\ 4.65\\ \hline\end{array}$ c) $\begin{array}{r}8.48\\ 6.69\\ \hline\end{array}$ d) $\begin{array}{r}2.76\\ 3.43\\ \hline\end{array}$

e) $\begin{array}{r}7.97\\ 7.37\\ \hline\end{array}$ f) $\begin{array}{r}4.49\\ 2.59\\ \hline\end{array}$ g) $\begin{array}{r}6.81\\ 8.49\\ \hline\end{array}$ h) $\begin{array}{r}6.37\\ 1.94\\ \hline\end{array}$

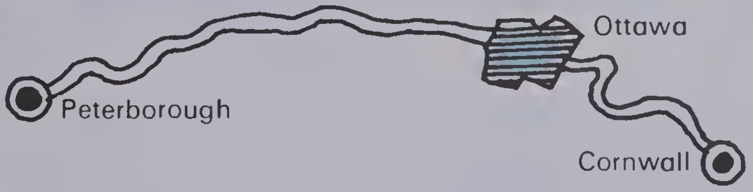
i) $\begin{array}{r}5.88\\ 9.27\\ \hline\end{array}$ j) $\begin{array}{r}8.67\\ 0.57\\ \hline\end{array}$ k) $\begin{array}{r}4.76\\ 8.45\\ \hline\end{array}$ l) $\begin{array}{r}1.68\\ 2.49\\ \hline\end{array}$ m) $\begin{array}{r}3.86\\ 4.34\\ \hline\end{array}$ n) $\begin{array}{r}3.79\\ 7.44\\ \hline\end{array}$

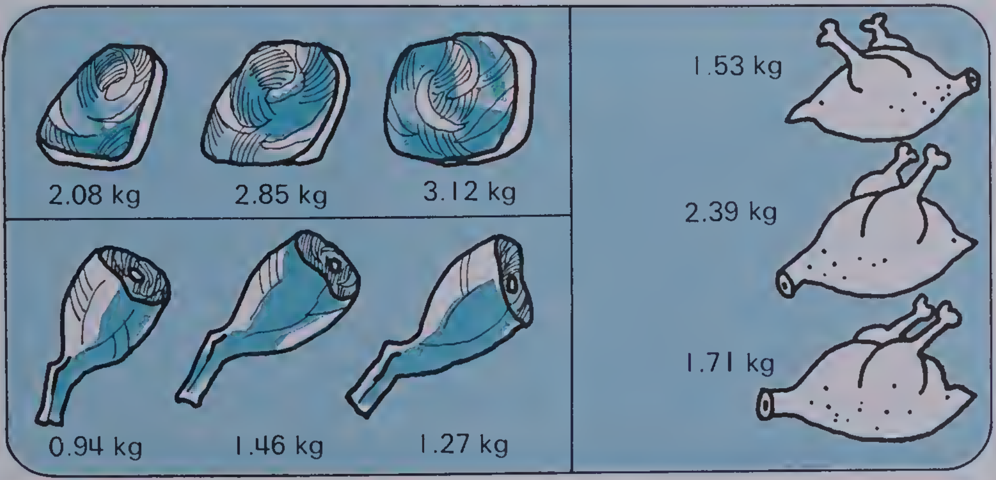
o) $\begin{array}{r}2.92\\ 3.25\\ \hline\end{array}$ p) $\begin{array}{r}5.58\\ 0.49\\ \hline\end{array}$ q) $\begin{array}{r}1.99\\ 6.37\\ \hline\end{array}$ r) $\begin{array}{r}7.76\\ 9.68\\ \hline\end{array}$ s) $\begin{array}{r}9.84\\ 6.78\\ \hline\end{array}$ t) $\begin{array}{r}4.65\\ 2.59\\ \hline\end{array}$

3. Neill wants to buy a long woollen scarf that costs $3.98. The sales tax is $0.24. How much should he give the cashier?

4. The plan for a bookcase shows shelves 2.24 m long, 1.68 m long, and 1.12 m long. How much shelving would you need to build this bookcase?

5. Bus fare from Peterborough to Ottawa is $10.55 and from Ottawa to Cornwall is $4.60. How much would you pay to travel by bus from Peterborough to Cornwall?





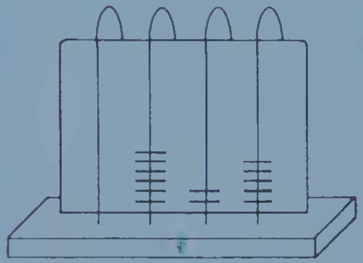
6. Find the total mass of
   a) the roasts of beef,
   b) the legs of mutton,
   c) the chickens.
   d) If you were buying a week's food for your family, what would you buy? What would be its total mass?

Subtraction / 2 Decimals / Regrouping

A

SUBTRACT.

6.25
3.78



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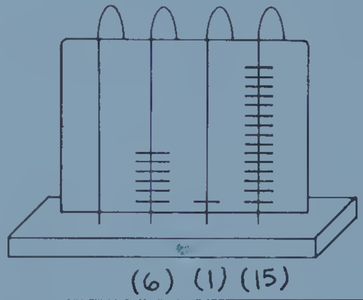

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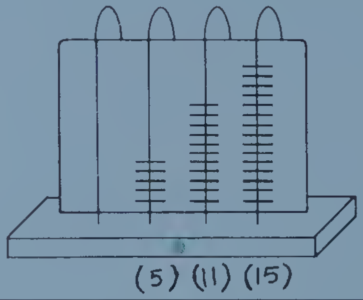

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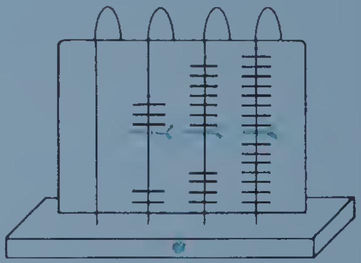


B

6.25 = 6 and 1 tenth and 15 hundredths
= 5 and 11 tenths and 15 hundredths
3.78 = 3 and 7 tenths and 8 hundredths

2 and 4 tenths and 7 hundredths

C

6.25 ↓
3.78

2.47

Think	Record
15, 7	7
11, 4	4
5, 2	2

IN ACTION

1. Subtract this way.

5.42 ↓
2.74

2.68

a) 5.21
2.49

b) 4.14
3.39

c) 6.02
4.89

d) 3.32
1.74

e) 7.11
5.46

f) 2.37
0.49

g) 8.44
5.56

h) 9.20
4.49

i) 7.14
3.47

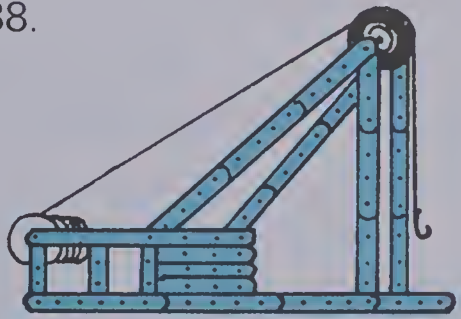
j) 3.17
0.78

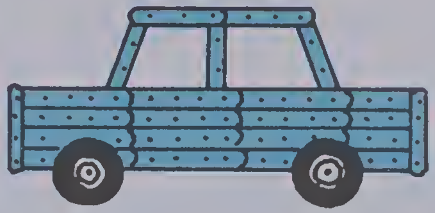
2. Subtract.

a)	b)	c)	d)	e)	f)
4.35	6.15	5.33	2.17	4.21	6.02
3.57	4.92	2.58	0.30	2.25	3.58

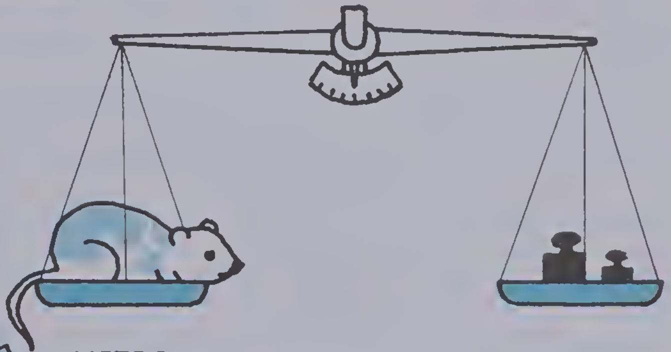
g)	h)	i)	j)	k)	l)
8.14	3.07	3.12	6.33	2.23	7.45
6.38	2.18	1.59	4.75	0.45	3.47

3. Gunter wanted to buy a building kit. Model Mart was selling one for $9.88. The Craft Shoppe had a similar kit on sale for $7.99. How much would Gunter save by buying the building kit at the Craft Shoppe?

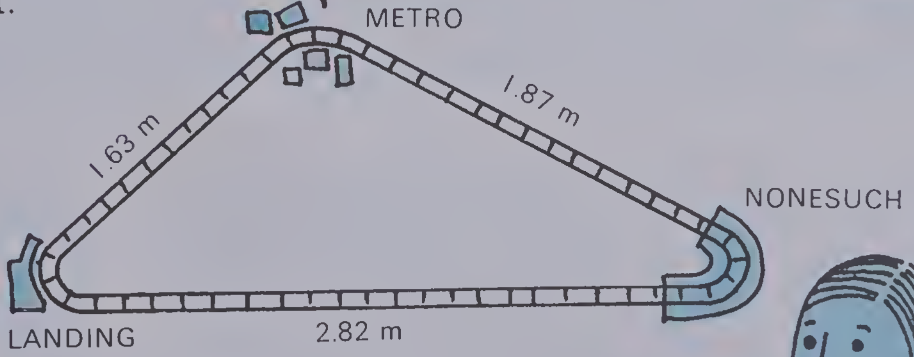




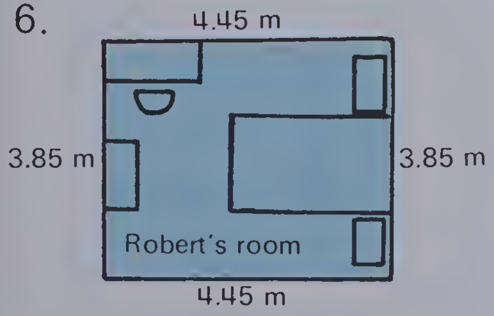
4. The Grade 4 class decided to compare the masses of their pet guinea pigs. Sandy's mass was 1.10 kg and Pepper's mass was 0.85 kg. Which guinea pig was heavier? How much heavier?

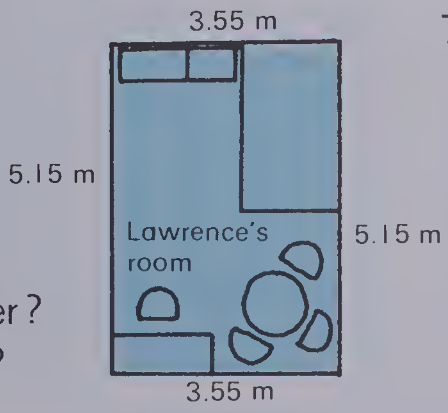


5. Shelley was setting up a model train set. How much more track did she need for the route from Landing to Metro to Nonesuch than for the route from Landing to Nonesuch?


METRO
1.63 m
1.87 m
NONESUCH
LANDING
2.82 m

6.


4.45 m
3.85 m
3.85 m
Robert's room
4.45 m


3.55 m
5.15 m
Lawrence's room
5.15 m
3.55 m

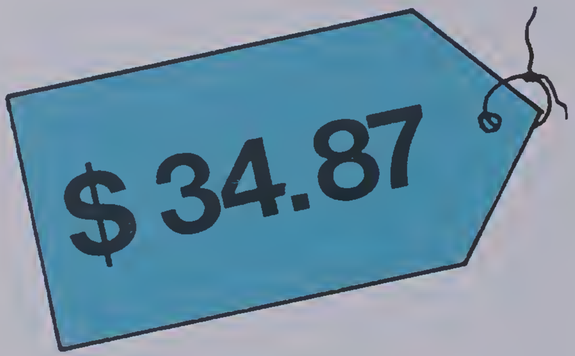
a) Which room has the greater perimeter?

b) How much greater?

7. The Neufeldts went to a restaurant for supper Friday night. Their meal cost $29.35, but the waiter added incorrectly and wrote $32.15 on the bill. By how much was he in error?

EXPLORE

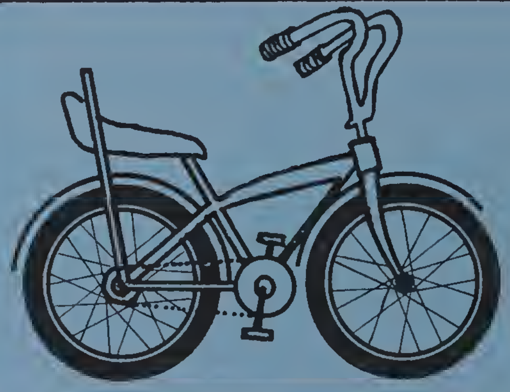
Money



We usually read this amount as "thirty-four dollars and eighty-seven cents".

We could read it as "thirty-four decimal eight seven dollars".

In $34.87,
the 3 tells us 30 dollars,
the 4 tells us 4 dollars,
the 8 tells us 80 cents, and
the 7 tells us 7 cents.



Convertible Hi-Rise is for boys or girls. Hi-Rise handlebars and banana saddle. Front/rear fenders, reflectorized pedals. With stand.

$ 34.87

IN ACTION

1. Write the 2 ways you could read each of the following.
   a) $1.61 b) $8.72 c) $90.25 d) $66.59 e) $38.36

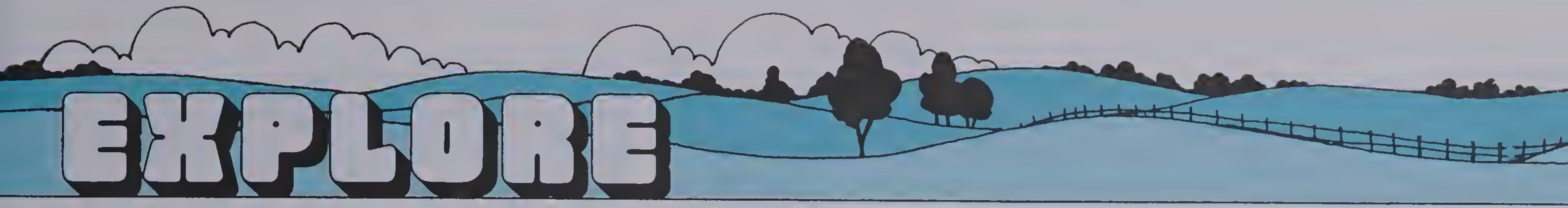
2. What value does each coloured digit represent?
   a) $**9**.73 b) $1.**9**2 c) $5.6**0** d) $7.**8**1 e) $3.0**7**
   f) $**5**2.14 g) $13.**2**5 h) $3**5**.75 i) $**7**9.80 j) $40.9**3**

3. Write the amounts in dollars.
   a) 6 dollars, 8 dimes, and 4 cents
   b) 3 dollars, 3 dimes, and 2 cents
   c) 5 dollars, 0 dimes, and 9 cents
   d) 1 dollar, 7 dimes, and 5 cents
   e) 8 dollars, 2 dimes, and 1 cent
   f) 4 dollars, 5 dimes, and 0 cents
   g) 12 dollars, 1 dime, and 3 cents
   h) 37 dollars, 4 dimes, and 6 cents
   i) 68 dollars, 6 dimes, and 7 cents
   j) 44 dollars, 9 dimes, and 8 cents

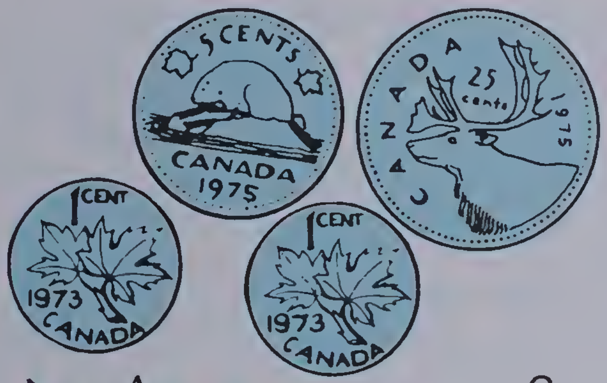
4. What is the amount?

a)	b)	c)	d)	e)
$4.00	$11.00	$36.00	$42.00	$75.00
0.60	0.30	0.70	0.00	0.40
0.03	0.08	0.01	0.09	0.00

EXPLORE

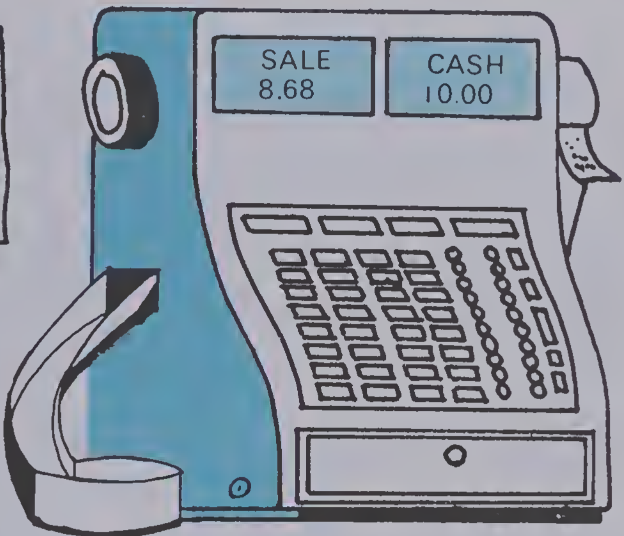


Check Your Change



5 CENTS
CANADA
1975
25 cents
CANADA
1975
1 CENT
1973
CANADA
1 CENT
1973
CANADA

BANK OF CANADA BANQUE DU CANADA
UN 1 ONE
DOLLAR
CANADA



SALE
8.68
CASH
10.00

IN ACTION

Counting my change :
"$8.68, $8.69, $8.70, $8.75, $9.00, $10.00"

1. Copy and complete.

Cash	Sale	Coins and Bills	Change
$ 2.00	$ 1.48	2 quarters, 2 pennies	$0.52
5.00	3.67		
7.00	5.19		
8.50	8.29		
10.00	6.33		
10.26	9.26		
20.00	14.99		

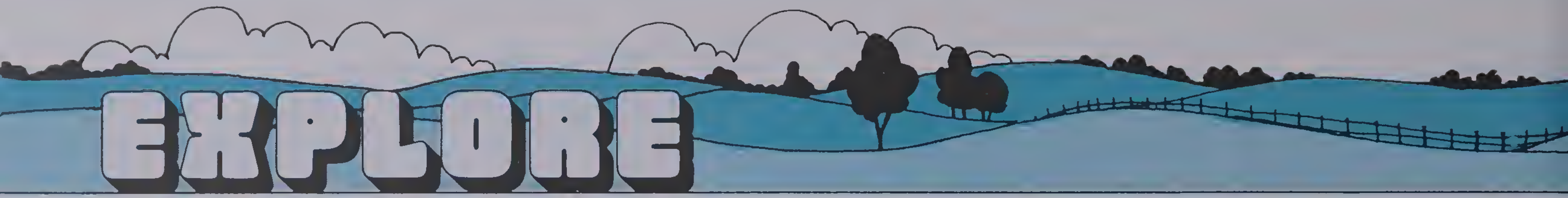
2. Copy and complete.

a)

Cash	Sale	Change
$ 1.00	$ 0.59	$ 0.41
	2.34	0.66
5.50	5.49	
	7.29	2.71
18.00		0.91
11.00	10.84	
	21.95	3.05
6.00		1.24

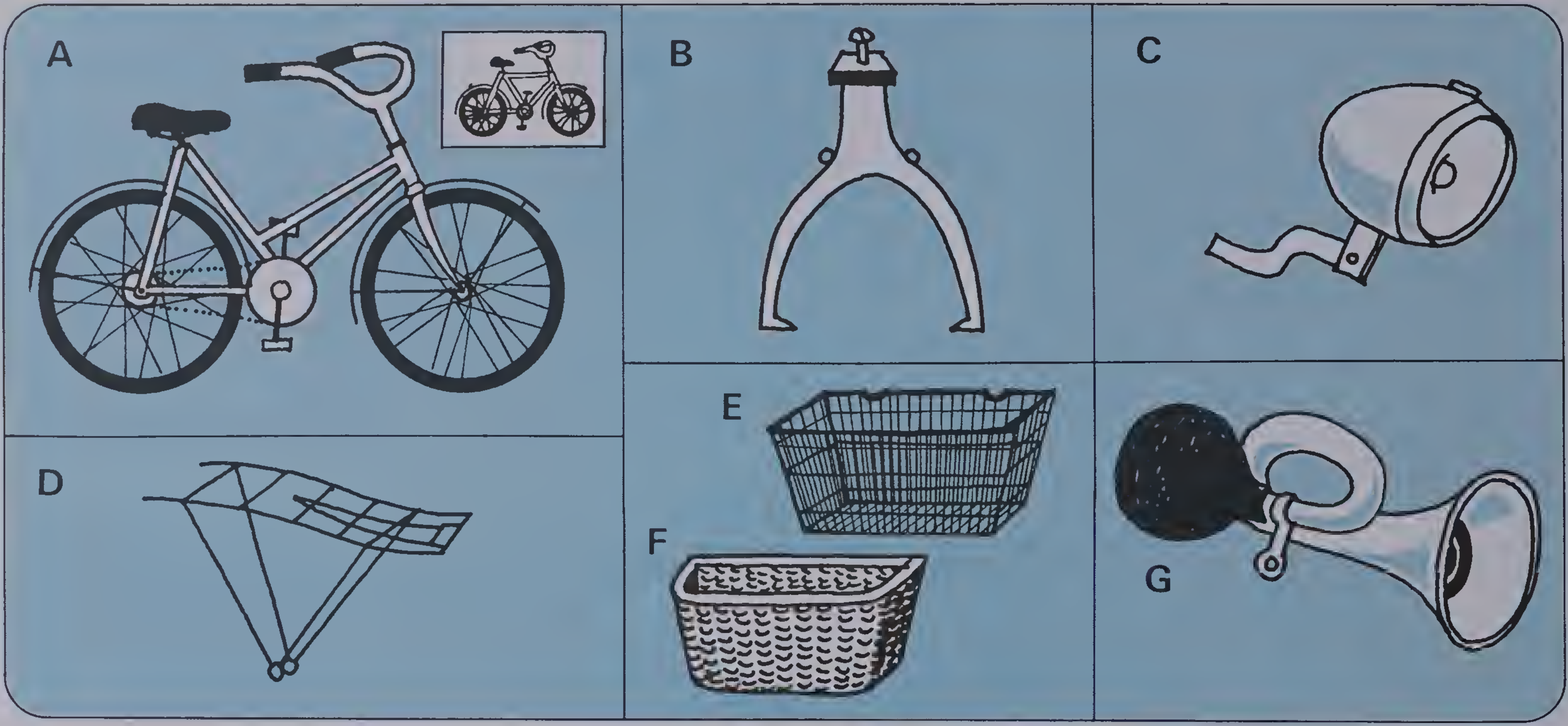
b)

Cash	Sale	Change
	$ 11.70	$ 3.30
$ 4.00		1.32
2.00	1.46	
2.50		0.25
	3.21	1.79
8.00	7.33	
13.00		0.97
20.00	16.00	



EXPLORE

Catalogue Shopping



A Girl's bicycle (boy's bicycle in insert) **$52.98**
Standard Bicycle
Strong double-frame steel construction.
Dependable coaster brakes. 50 cm wheels.
Baked-on enamel finish. Mattress saddle.
Touring handlebars.

B Kickstand **$3.16**
Chrome-plated steel. For 50 cm wheel.

C Headlight **$4.20**
Chrome plated. Double-bulb headlight;
on/off switch. Use 2 'D' batteries.
(Batteries not included.)

D Rear Carrier **$5.49**
Light-weight alloy. Spring clip holds parcels.
For 50 cm bikes.

E Plastic Basket **$2.25**
Fits all bikes. 38 cm × 25 cm × 20 cm deep.
(Hardware included.)

F Natural Willow Basket **$5.86**
Fits all bikes. 35 cm × 25 cm × 20 cm deep.
(Hardware included.)

G Bugle Horn **$3.18**
Chromed metal, 23 cm long. (Hardware included.)

IN ACTION

1. What value does each digit represent?

a) **$3.16**

b) **$5.49**

c) **$2.25**

d) **$5.86**

e) **$4.20**

f) **$3.18**

2. Find the total (T).

a)

M & W
SPORTS
$5.49
4.20
T

b)

M & W
SPORTS
$3.16
5.86
T

c)

M & W
SPORTS
$4.20
3.18
T

d)

M & W
SPORTS
$2.25
5.49
T

e)

M & W
SPORTS
$52.98
2.25
T

f)

M & W
SPORTS
$52.98
3.16
3.18
T

g)

M & W
SPORTS
$5.49
4.20
3.18
T

h)

M & W
SPORTS
$52.98
5.49
4.20
T

i)

M & W
SPORTS
$3.16
5.49
4.20
T

j)

M & W
SPORTS
$52.98
5.86
3.16
T

3. If you wanted to buy the kickstand and the plastic basket for your bicycle, how much money would you need?

4. How much money would you need to buy the willow basket and the headlight?

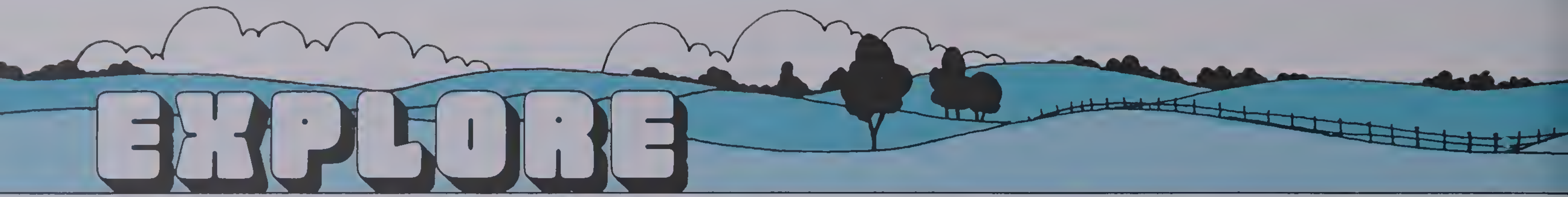
5. How much money would the bicycle, the kickstand, and the bugle horn cost?

6. You have $6.00. How much change would you get if you bought the rear carrier?

7. You want to buy the bugle. How much change would you get if you have $5.00 to spend?

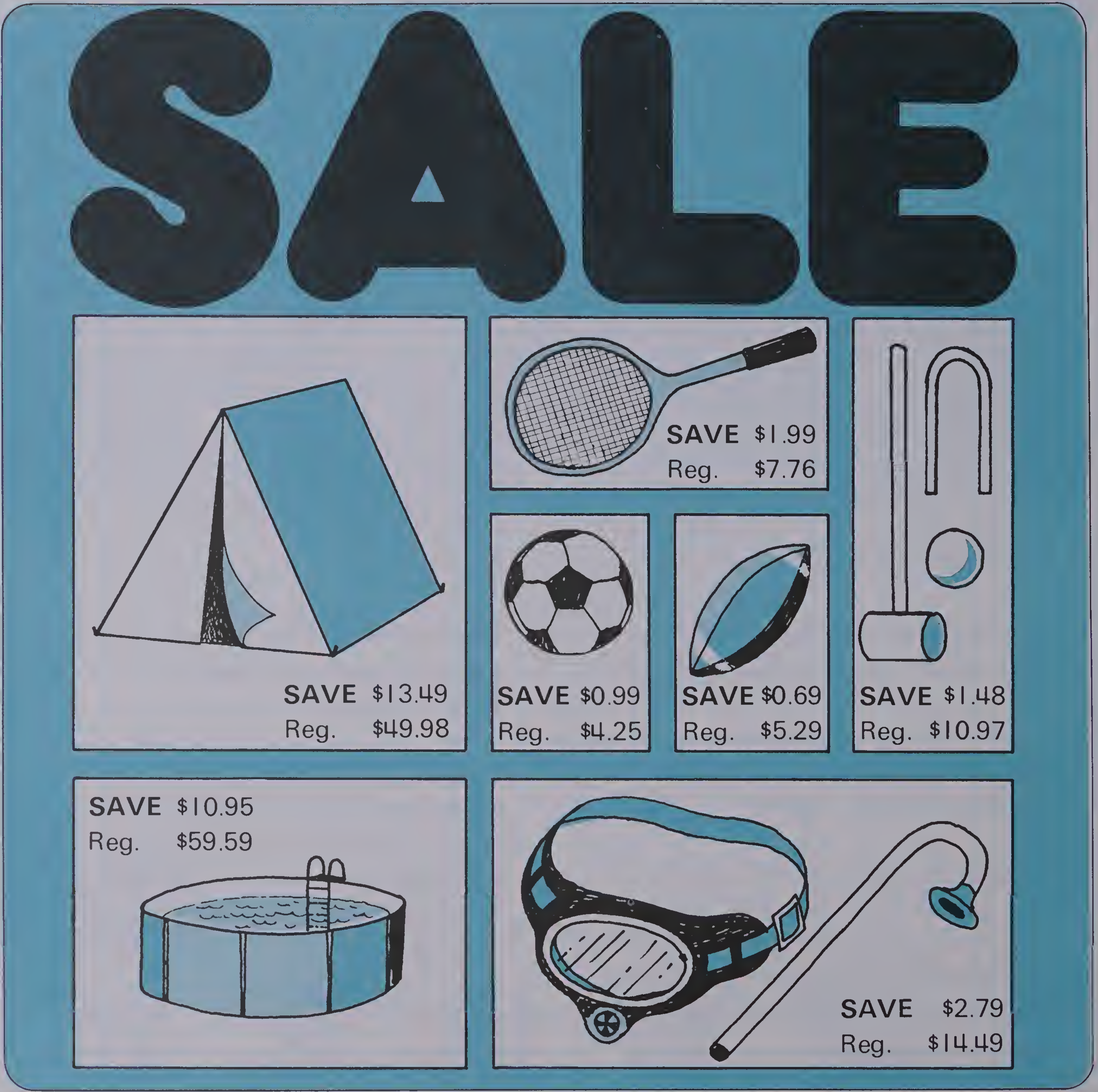
8. You were given a 5 dollar bill, a 2 dollar bill, and a 1 dollar bill for your birthday. How much money would you have left if you bought the headlight and the bugle horn?

9. What items would you like to buy? How much would they cost? Suppose you can earn $5.00 a week by shovelling snow. How many weeks would you have to work to earn enough for your purchases? What change would you receive?



EXPLORE

Looking for Bargains


SALE
SAVE $13.49
Reg. $49.98
SAVE $1.99
Reg. $7.76
SAVE $0.99
Reg. $4.25
SAVE $0.69
Reg. $5.29
SAVE $1.48
Reg. $10.97
SAVE $10.95
Reg. $59.59
SAVE $2.79
Reg. $14.49

IN ACTION

1. Copy and complete.

Item	Regular Price	Saving	Sale Price
Tent	$49.98	$13.49	$36.49
Tennis racket			
Croquet set			
Soccer ball			
Football			
Swimming pool			
Snorkle, mask			

2. What value does each digit represent?

a) $4.25
b) $5.29
c) $7.76
d) $10.97
e) $14.49
f) $59.59

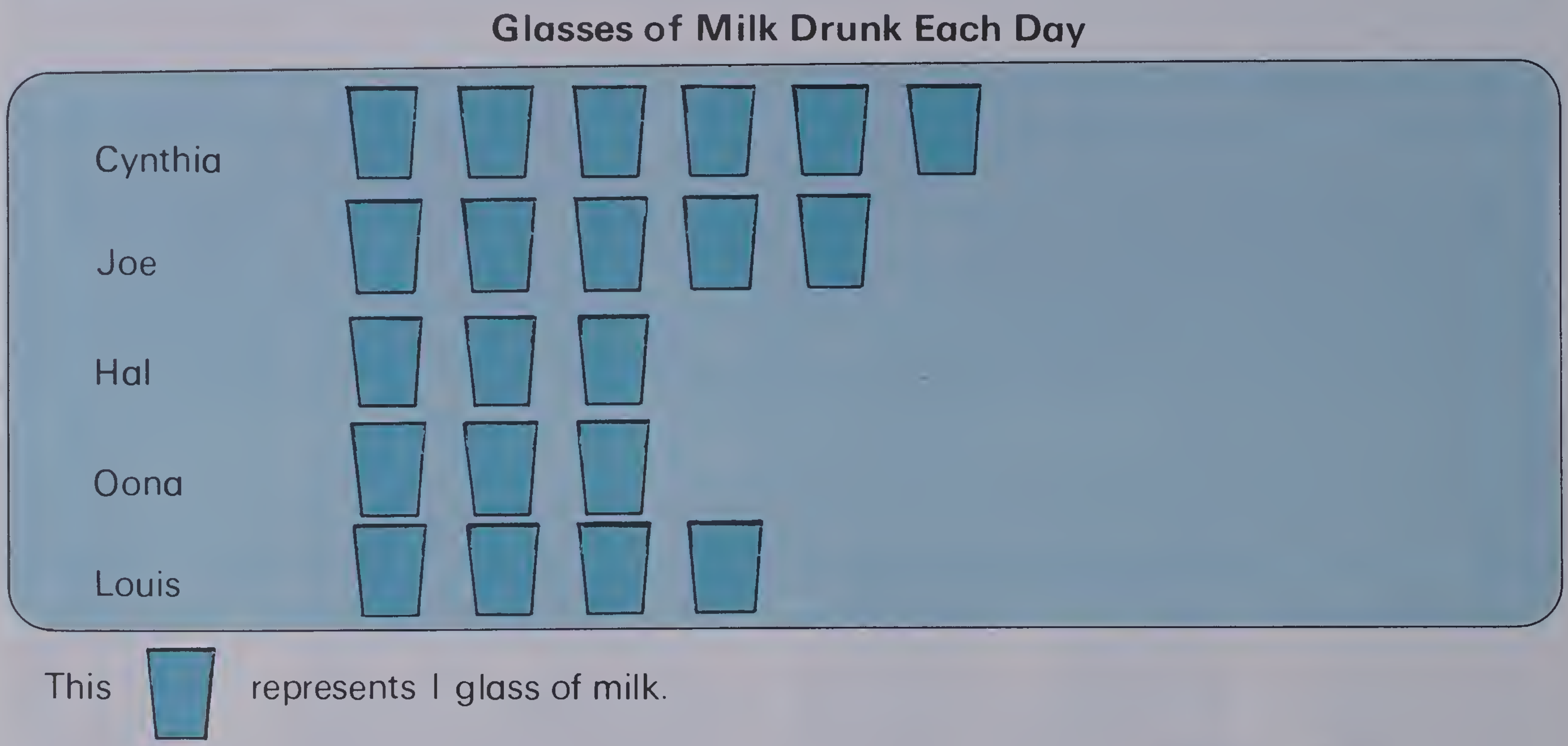
3. You have $50 to spend. What change would you receive from buying each of these bargains?
   a) tent
   b) snorkle, mask
   c) tennis racket
   d) swimming pool

4. a) How much would you usually pay for the swimming pool and snorkle set?
   b) What is the total saving during the sale?
   c) If the sales tax is $4.22, what would be the total bill for these "bargains"?
   d) What change would you receive from $75?

5. Another store has a soccer ball on sale for $2.99 and a football on sale for $4.99. If you wanted to buy both of these items, where should you shop?

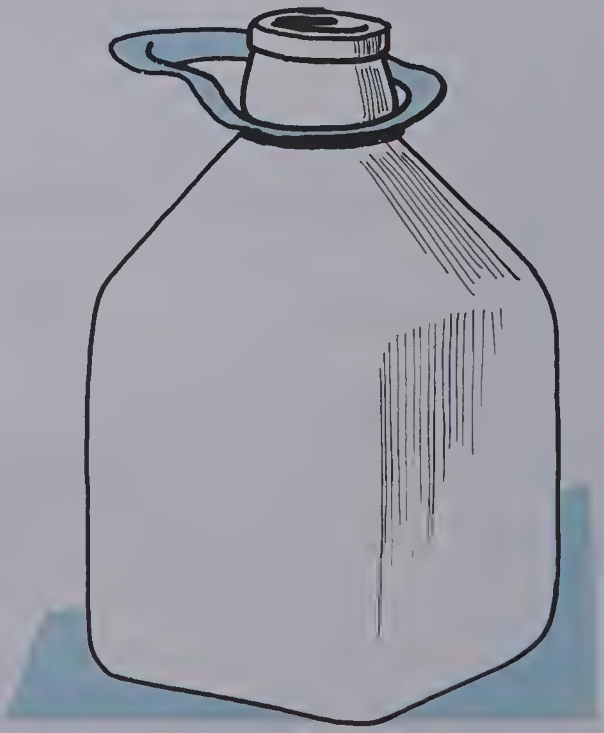
Pictographs

Graphs give us information.
What does this graph tell you?



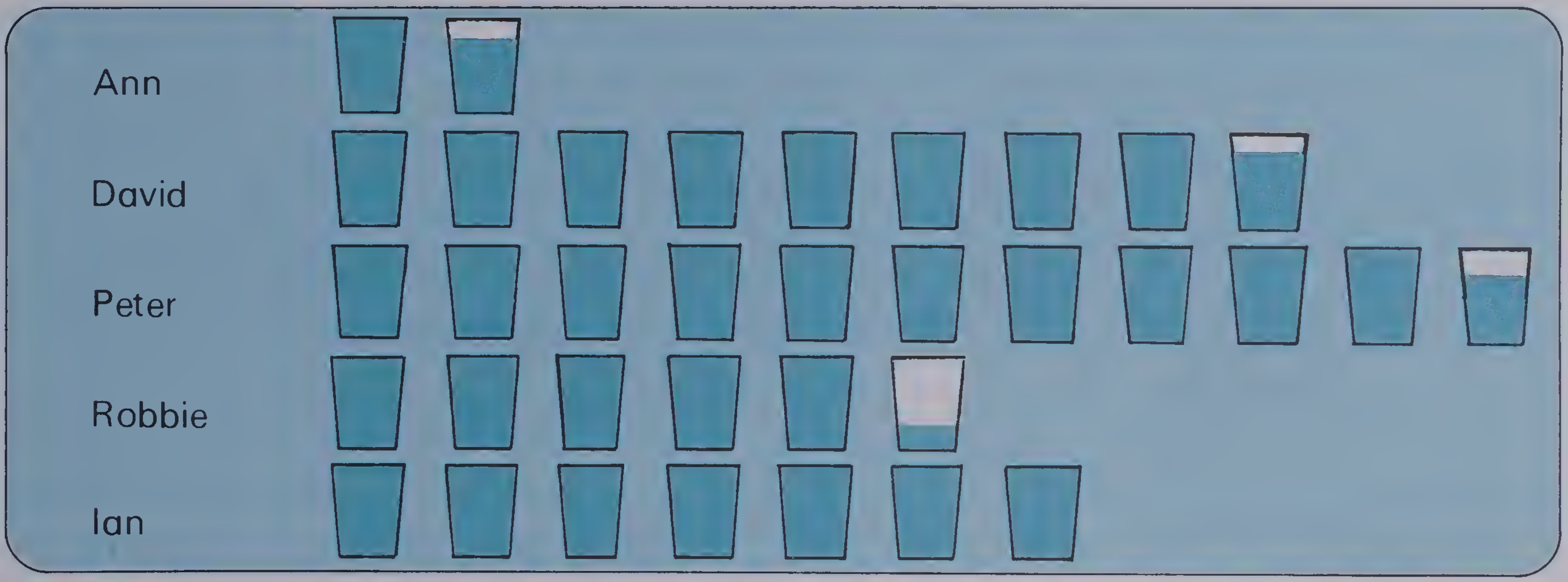
Glasses of Milk Drunk Each Day

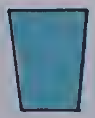
This ▯ represents 1 glass of milk.



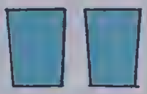
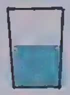
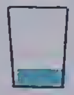
1. What is the name of this graph?
2. Who drinks the most milk?
3. Who drinks the least milk?
4. Which one of the children drinks 5 glasses of milk each day?
5. What is the total number of glasses of milk the 5 children drink each day?
6. If a litre container holds about 4 glasses of milk, about how many litres do the children drink each day?
7. Why do we call this kind of graph a **pictograph**?

Glasses of Milk Drunk Each Week



This  represents 4 glasses of milk.

YOGURT
SOUR CREAM
COTTAGE CHEESE
BUTTER

1. How many glasses does this represent? 
2. How many glasses does this represent? 
3. How many glasses does this represent? 
4. How many glasses of milk does Robbie drink each week?
5. Who drinks the most milk?
6. Who drinks the least milk?
7. How many glasses of milk does David drink?
8. What is the total number of glasses of milk the children drink each week?
9. If a litre container holds about 4 glasses of milk, about how many litres do the children drink each week?
10. Is the name of the graph a good one?

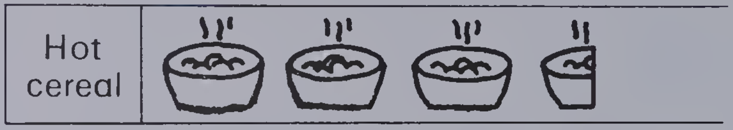
Remember the steps in graphing!

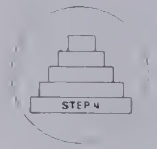
Collect information. 𝍸 ||

Sort information.

Hot cereal
7

Draw graph.





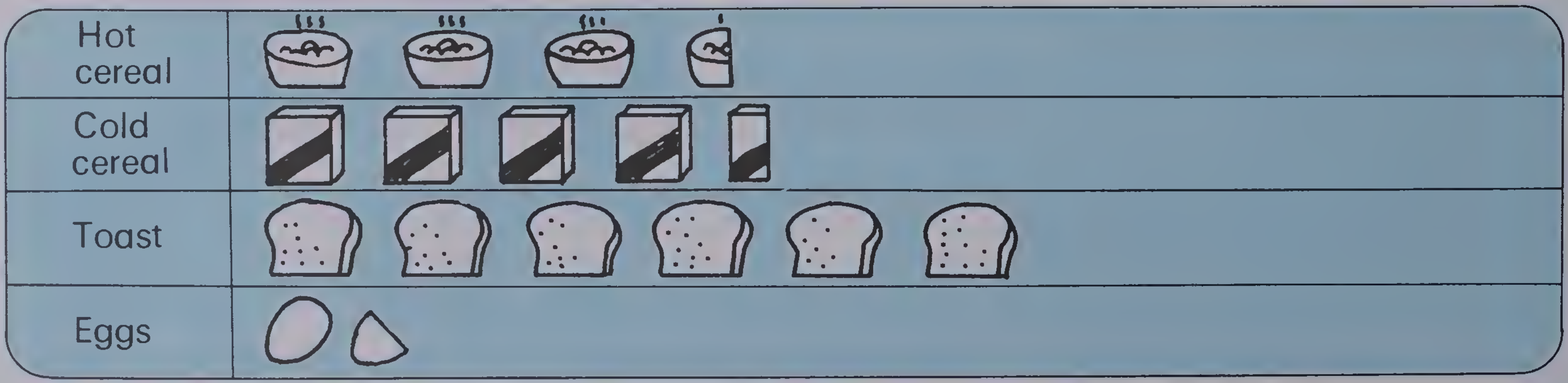
Name graph. **Breakfast Foods**

Read graph. **Altogether 7 people eat hot cereal.**

Maria collected information and made this chart.

Breakfast foods	Hot cereal	Cold cereal	Toast	Eggs
Number of people	7	9	12	3

She used her information to draw a pictograph.



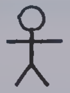
1. Write a name for the graph.

2. Write 6 facts you can learn from reading the graph.

IN ACTION

1. Collect information from members of your class to complete this chart.

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Number born in month												

2. Let this symbol  represent 2 people.

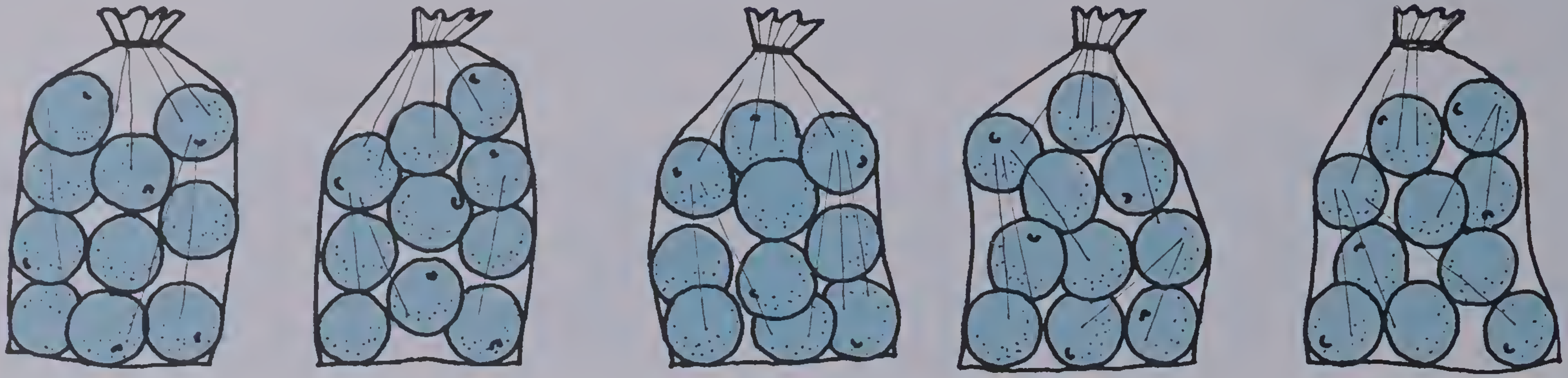
Use the information you collected to complete this graph in your workbook.

January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

3. Choose a name for your graph.
4. In which month are there the most birthdays?
5. In which month are there the least birthdays?
6. How many birthdays are there in May and June combined?
7. Write 3 other facts you can learn from reading your graph.

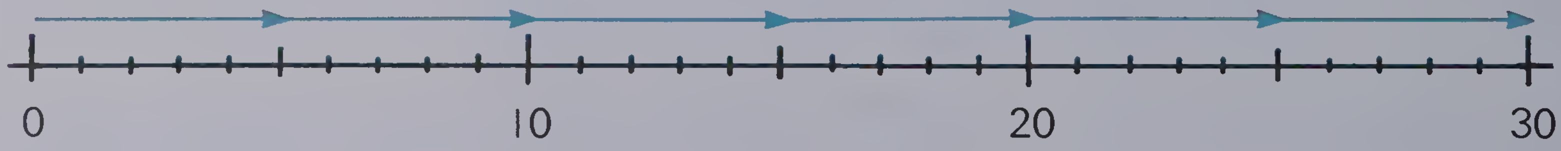
EXPLORE

Thinking About Multiplication



There are 5 bags.
There are 10 oranges in each bag.
We multiply to find the number of oranges.

Multiplication sentence
5 × 10 = 50
factor **factor** **product**



How many are in each set? How many sets are there?
Write the multiplication sentence.
Label the factors and the product.

X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X

In the array, how many rows are there?
How many columns are there?
Write the multiplication sentence.

IN ACTION

1. Draw a picture for each multiplication sentence.

a) 3 × 4 = 12 b) 4 × 8 = 32 c) 5 × 6 = 30 d) 6 × 7 = 42 e) 5 × 9 = 45

2. Complete the chart for the arrays.

a)
X X X X X X X
X X X X X X X
X X X X X X X
X X X X X X X
X X X X X X X

b)
X X X X X X X X
X X X X X X X X
X X X X X X X X

c)
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X

Array	Number of rows	Number of columns	Factors	Product	Multiplication sentence	Number pair
a)						(5,7)
b)						
c)						

3. For each number pair, write the product and the multiplication sentence.

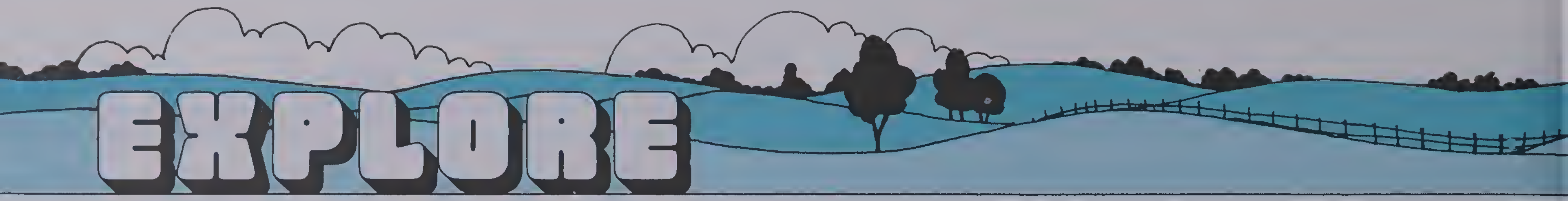
a) (6,8) b) (4,9) c) (3,7) d) (5,6) e) (8,7) f) (9,8)

4. Write 2 factors for each product.

a) 27 b) 36 c) 49 d) 72 e) 45 f) 63 g) 24 h) 80

5. Draw an array.

a) Write the multiplication sentence. b) Draw a line to separate your array into 2 arrays.
c) Write a multiplication sentence for each array.



Multiples

Complete the pattern.

10, 10 + 10, 10 + 10 + 10 to 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10

$1 \times 10 = 10$, $2 \times 10 = 20$, $3 \times 10 = ?$ to $10 \times 10 = ?$

10, 20, 30, and so on are **multiples of 10.**

Since $0 \times 10 = 0$, 0 is also a multiple of 10.

In the same way, $0 \times 7 = 0$, 0 is a multiple of 7.
We find that 0 is a multiple of every number.
Since this is so, sometimes we may only wish
to list the multiples of a number that are **greater than 0.**

These are the multiples of 6
that are less than 35.
0, 6, 12, 18, 24, 30

These are the multiples of 6
that are less than 35
and greater than 0.
6, 12, 18, 24, 30

IN ACTION

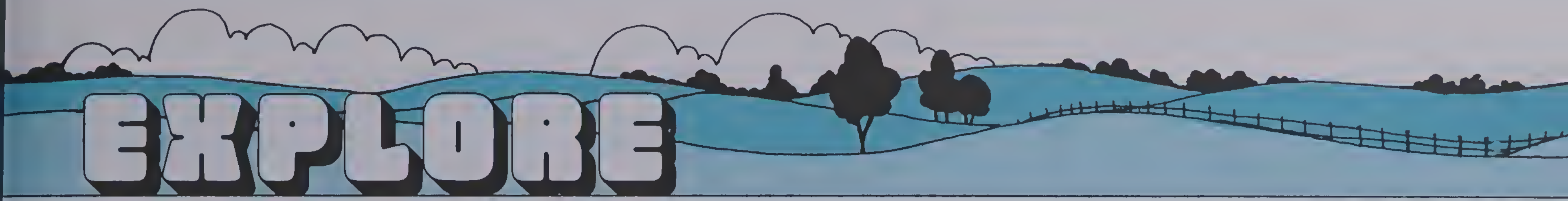
1. List the first 6 multiples greater than 0 of :

a) 4 b) 5 c) 8 d) 7 e) 9 f) 3 g) 1 h) 11

2. List the multiples of :
   a) 10, between 50 and 90 b) 3, between 10 and 30
   c) 7, between 40 and 70 d) 8, between 20 and 60

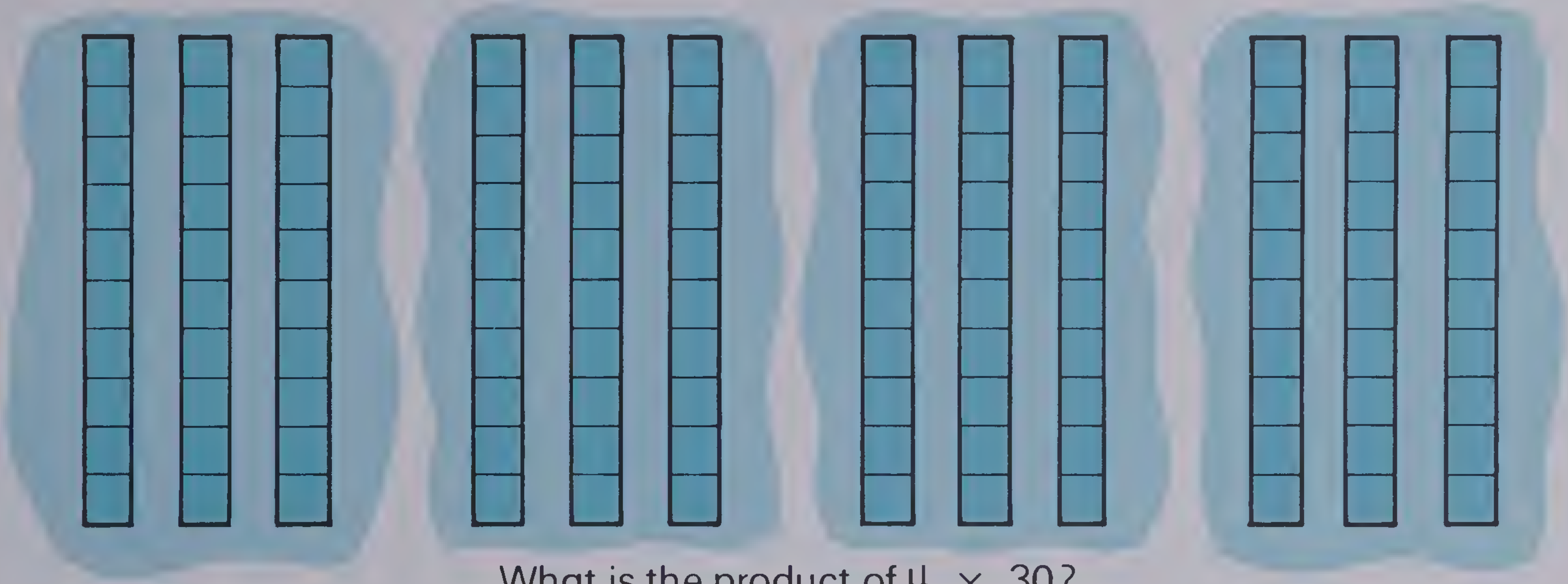
3. List the multiples of :
   a) 5, which are greater than 6 and less than 20
   b) 4, which are greater than 0 and less than 17
   c) 9, which are greater than 10 and less than 60

4. 0, 10, 20, 30, 40, 50 are the first 6 multiples of 10.
   List the first 6 multiples of : a) 1 b) 100 c) 1000



EXPLORE

Multiplication / A Multiple of 10 by a 1-Digit Factor



What is the product of 4 × 30?

Think 4 × 3 = 12,

then 4 × 30 = 120

IN ACTION

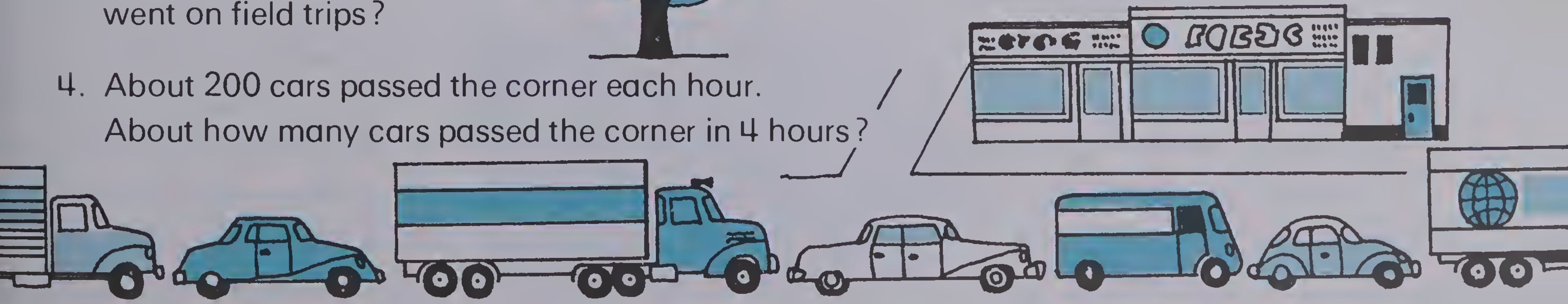
1. Think each product and record it.

a) 8 × 3 8 × 30	b) 6 × 4 6 × 40	c) 9 × 5 9 × 50	d) 7 × 2 7 × 20	e) 4 × 6 4 × 60	f) 3 × 8 3 × 80
g) 5 × 70	h) 8 × 90	i) 6 × 60	j) 9 × 70	k) 7 × 40	l) 9 × 30

2. About 30 children went on each field trip. There were 6 field trips. About how many children went on field trips?

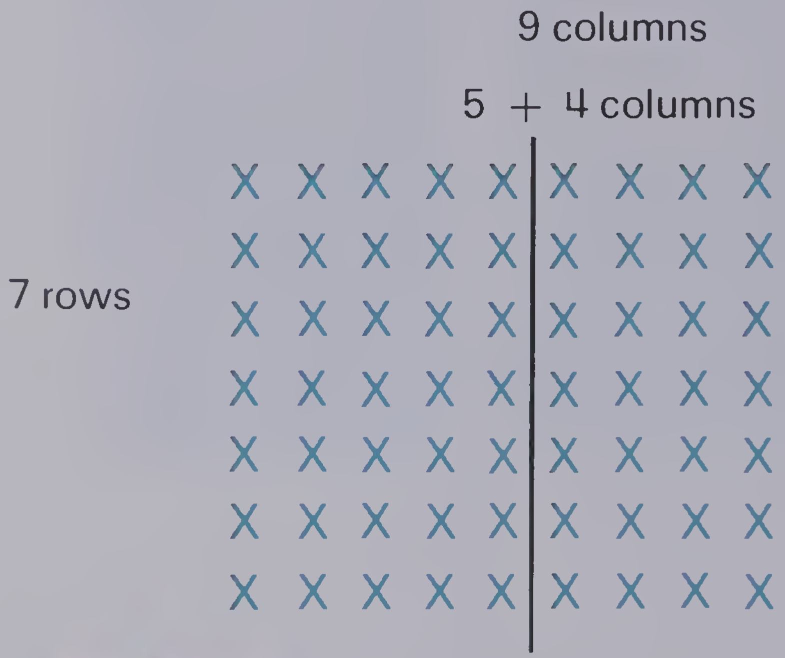
3. There are about 40 starlings in each maple tree. There are 8 maple trees. About how many starlings are there?

4. About 200 cars passed the corner each hour. About how many cars passed the corner in 4 hours?



A Property of Multiplication

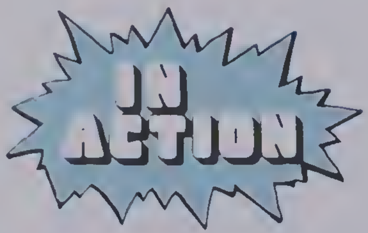
We can think of an array as the sum of 2 arrays.



$7 \times 9 = 63$

We could think this way.

$$\begin{aligned} 7 \times 9 &= 7 \times (5 + 4) \\ &= (7 \times 5) + (7 \times 4) \\ &= 35 + 28 \\ &= 63 \end{aligned}$$



1. Complete.

a) $$\begin{aligned} 9 \times 7 &= 9 \times (4 + 3) \\ &= (9 \times ?) + (9 \times 3) \\ &= ? + ? \\ &= ? \end{aligned}$$

b) $$\begin{aligned} 6 \times 8 &= 6 \times (4 + ?) \\ &= (6 \times ?) + (6 \times ?) \\ &= ? + ? \\ &= ? \end{aligned}$$

c) $$\begin{aligned} 5 \times 12 &= 5 \times (10 + ?) \\ &= (5 \times ?) + (5 \times ?) \\ &= ? + ? \\ &= ? \end{aligned}$$

2. Use 10 to help you multiply.

a) $7 \times 18 = 7 \times (10 + 8)$
b) $9 \times 14 = 9 \times (10 + 4)$
c) $6 \times 15 = 6 \times (10 + 5)$
d) $8 \times 17 = 8 \times (? + 7)$
e) $4 \times 19 = 4 \times (10 + ?)$
f) $5 \times 13 = 5 \times (? + ?)$

3. Use 10 to help you multiply.

a) 7×19
b) 6×14
c) 8×12
d) 9×19
e) 8×18
f) 5×17
g) 9×15
h) 4×18
i) 8×13
j) 7×16

Multiplication / A Multiple of 10 by a 2-Digit Factor Less than 20

Find the product of 40 × 17.

$$\begin{aligned} \text{Since } 17 &= 10 + 7, \\ \text{then } 40 \times 17 &= 40 \times (10 + 7) \\ &= (40 \times 10) + (40 \times 7) \\ &= 400 + 280 \\ &= 680 \end{aligned}$$

IN ACTION

1. Complete.

a) $20 \times 12 = 20 \times (10 + 2)$
$= (20 \times 10) + (20 \times 2)$
$= \ ? + \ ?$
$= \ ?$

b) $60 \times 19 = 60 \times (10 + 9)$
$= (60 \times 10) + (60 \times 9)$
$= \ ? + \ ?$
$= \ ?$

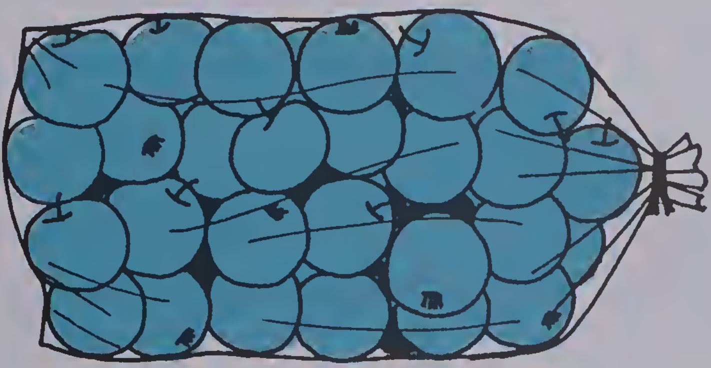
2. Find the products.

a) 30 × 11
b) 50 × 14
c) 60 × 13
d) 80 × 12
e) 90 × 15
f) 20 × 19
g) 70 × 17
h) 40 × 16
i) 90 × 17
j) 50 × 19

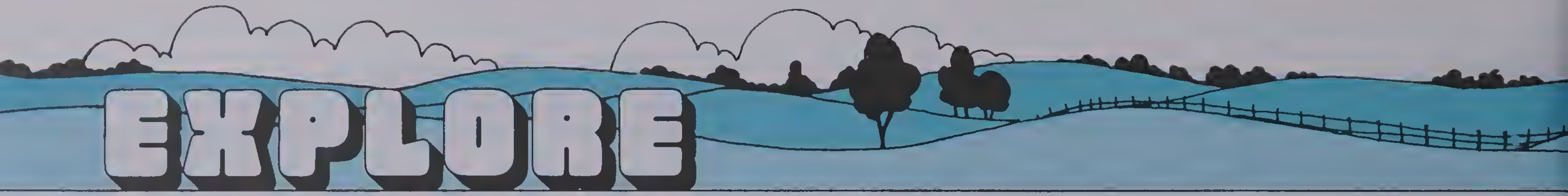
3. There are about 60 cans of apple juice in each layer on a shelf. There are 11 layers. About how many cans of apple juice are on the shelf?

4. There are about 30 beans in a layer of the jar. There are about 15 layers. About how many beans are in the jar?

5. There are about 70 seats in each row of the theatre. There are 19 rows on the main floor. About how many seats are on the main floor?



6. There are about 40 apples in each bag. There are 14 bags. About how many apples are there?



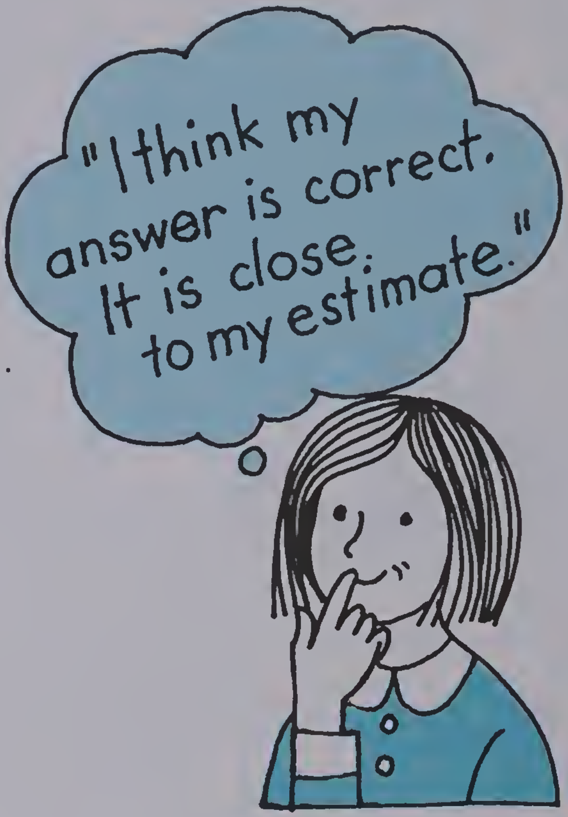
Multiplication /A 2-Digit Factor by a 1-Digit Factor

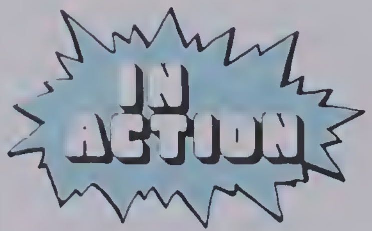
Multiply 57 by 8.

First **estimate** the answer.
Since 57 is about 60,
the answer is about 60 × 8 or 480.

Since 57 = 50 + 7,
we can multiply 7 by 8 and 50 by 8.

$$57 \times 8 = \begin{array}{r} 50 + 7 \\ 8 \\ \hline 400 + 56 \\ = 456 \end{array}$$


"I think my answer is correct. It is close to my estimate."



1. What is the closest multiple of 10 for each number?

   a) 69 b) 71 c) 54 d) 88 e) 92 f) 76 g) 99 h) 38

2. Record the estimates.

   a) 87 × 9 is about 90 × 9 = ? b) 48 × 8 is about ? × 8 = ?
   c) 69 × 6 is about ? × 6 = ? d) 72 × 5 is about ? × 5 = ?
   e) 31 × 7 is about ? × 7 = ? f) 96 × 4 is about ? × 4 = ?

3. Estimate, then find the product.

   a) $\begin{array}{r} 66 \\ 8 \\ \hline \end{array}$ b) $\begin{array}{r} 29 \\ 5 \\ \hline \end{array}$ c) $\begin{array}{r} 38 \\ 9 \\ \hline \end{array}$ d) $\begin{array}{r} 41 \\ 7 \\ \hline \end{array}$ e) $\begin{array}{r} 72 \\ 6 \\ \hline \end{array}$ f) $\begin{array}{r} 91 \\ 9 \\ \hline \end{array}$

   g) $\begin{array}{r} 53 \\ 5 \\ \hline \end{array}$ h) $\begin{array}{r} 48 \\ 4 \\ \hline \end{array}$ i) $\begin{array}{r} 81 \\ 7 \\ \hline \end{array}$ j) $\begin{array}{r} 74 \\ 8 \\ \hline \end{array}$ k) $\begin{array}{r} 99 \\ 9 \\ \hline \end{array}$ l) $\begin{array}{r} 27 \\ 8 \\ \hline \end{array}$

   m) $\begin{array}{r} 32 \\ 7 \\ \hline \end{array}$ n) $\begin{array}{r} 57 \\ 3 \\ \hline \end{array}$ o) $\begin{array}{r} 64 \\ 5 \\ \hline \end{array}$ p) $\begin{array}{r} 83 \\ 4 \\ \hline \end{array}$ q) $\begin{array}{r} 72 \\ 9 \\ \hline \end{array}$ r) $\begin{array}{r} 46 \\ 6 \\ \hline \end{array}$

The Product of a 2-Digit Factor and a I-Digit Factor

Multiply 78 by 6.
The product should be about 80 × 6 or 480.

$$\begin{array}{rrrr} \text{Instead of writing } 78 = & 70 & + & 8 \\ \text{multiplying by } 6 & & & 6 \\ \cline{2-4} \text{and adding,} & 420 & + & 48 \\ & & = & 468 \end{array}$$

we can use a shorter form.

$$\begin{array}{r} 78 \\ 6 \\ \hline 48 \\ 420 \\ \hline 468 \end{array}$$

It is easier to add
when you write 48 and 420
in a **column**.

The estimate is close to this answer.
We think the answer is correct.

IN ACTION

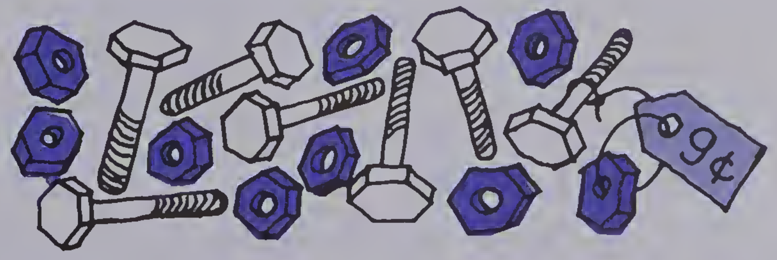
I. Estimate, and then find the product.

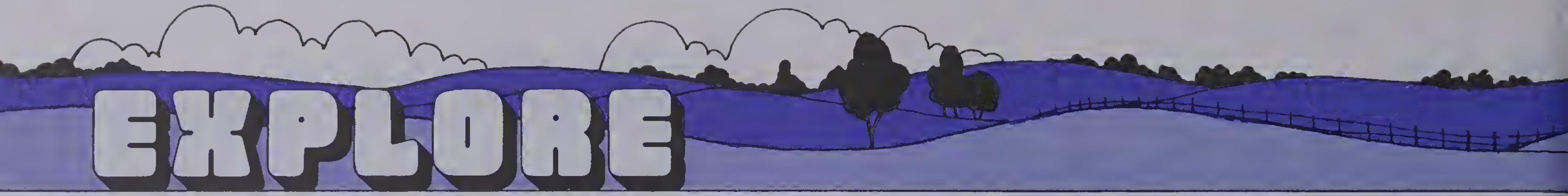
a)	b)	c)	d)	e)	f)	g)	h)	i)
72	39	56	41	91	19	29	82	93
6	4	3	8	7	9	6	4	9

2. Multiply.
   a) 85 by 9 We could estimate the product this way :
   80 × 9 = 720 or 90 × 9 = 810
   The answer is certainly between 720 and 810.

   b) 75 by 8 c) 57 by 7 d) 67 by 9 e) 91 by 6 f) 45 by 4

3. I bought 36 nuts and bolts
   at 9¢ a set. The cashier charged me $5.24.
   How could I check the amount before paying it?





EXPLORE

The Ordinary Multiplication Form

Multiply 89 by 7.
The product should be about 90 × 7 or 630.

Here the products are in a column.

$$\begin{array}{rl} 89 & \\ 7 & \\ \hline 63 & \leftarrow 9 \times 7 \\ 560 & \leftarrow 80 \times 7 \\ \hline 623 & \end{array}$$

Try this form. It is very short.

$$\begin{array}{r} 89 \\ 7 \\ \hline 623 \end{array}$$

Think	Record
63	3
56,62	62

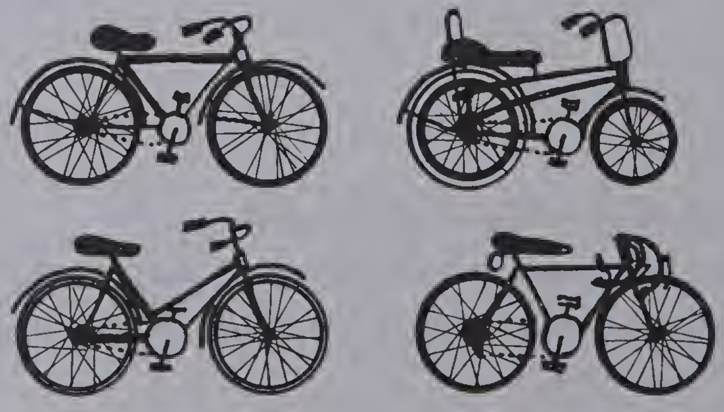
IN ACTION

1. Estimate, then find the product.

a) 37 × 4 b) 23 × 6 c) 35 × 8 d) 46 × 6 e) 67 × 7 f) 74 × 5
g) 86 × 7 h) 92 × 8 i) 49 × 4 j) 71 × 3 k) 82 × 6 l) 19 × 9
m) 27 × 8 n) 39 × 4 o) 51 × 6 p) 63 × 5 q) 89 × 9 r) 99 × 7

2. The school office has 36 packages of pencils with 6 pencils in each package.
   a) About how many pencils are there? Estimate to find the answer.
   b) How many pencils are there? Calculate the answer.

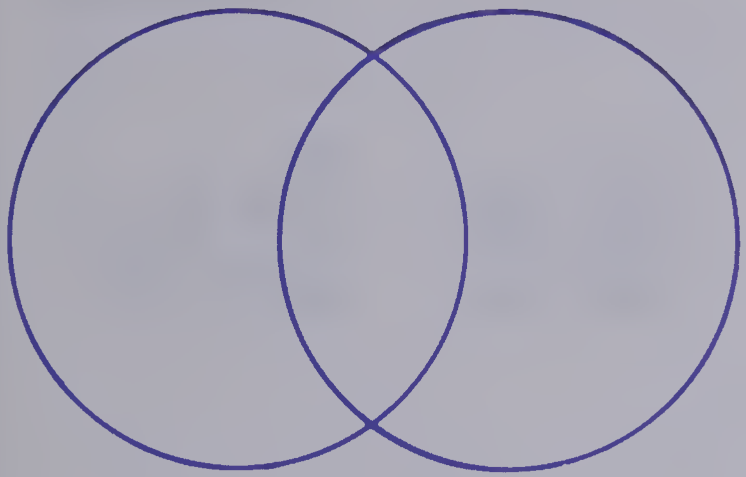
3. The parking lot has 9 rows. Each row has 42 parking spaces in it.
   a) About how many cars will the lot hold?
   b) How many cars will the lot hold?



4. Each bicycle wheel has 24 spokes.
   There are 8 wheels.
   How many spokes are there?
   Did you estimate
   before you calculated the answer?

Sorting

Use 2 circles like these for each question.



1. In one circle, write the names of the months you are in school.
   In the other circle, write the names of the months with 31 days.
   Write each name once only.
   Where will you write the names of the school months with 31 days?

2. In one circle, write the vowels of the alphabet.
   In the other circle, write the letters of your name.
   Write each letter once only.
   Where will you write the vowels of your name?

3. In one circle, write the names of the girls in your class.
   In the other circle, write the names of the children wearing green.

4. In one circle, write the numerals for even numbers less than 21.
   In the other circle, write the 2-digit numerals less than 21.

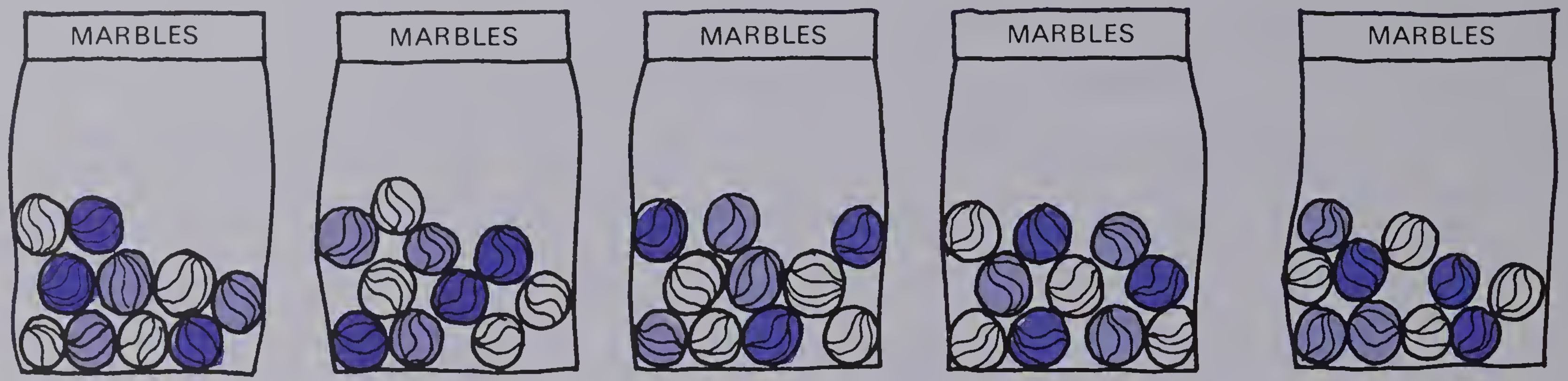
5. In one circle, write the numerals 2, 3, 5, 7, 11, 13, 17, 19.
   In the other circle, write the numerals for odd numbers less than 20.

6. In one circle, write the numerals that tell the value of coins.
   In the other circle, write the 2-digit multiples of 10.

For each question, what did you write in **both** circles?

EXPLORE

Thinking About Division



There are 50 marbles.
There are 5 plastic bags.
We divide to find the number of marbles in each bag.

Division sentence
50 ÷ 5 = 10

Multiplication tells how many X's in the array.
6 × 7 = 42

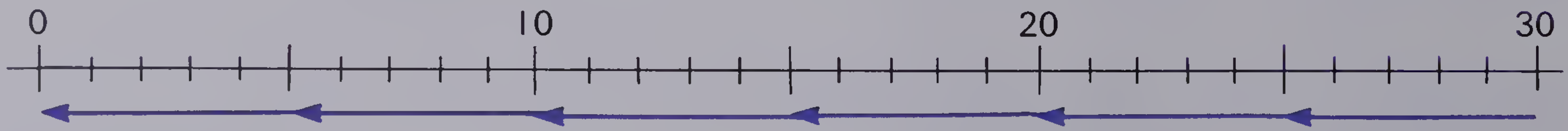
Division tells how many rows,
42 ÷ 7 = 6

or it tells how many columns.
42 ÷ 6 = 7

7 columns

X X X X X X X
X X X X X X X
6 rows X X X X X X X
X X X X X X X
X X X X X X X
X X X X X X X

We can think of division as finding how many times one number is contained in another.



30 ÷ 5 tells the number of fives in 30.
Write the division sentence.

IN ACTION

1. Draw a picture for each division sentence.

a) 27 ÷ 9 = 3 b) 28 ÷ 7 = 4 c) 40 ÷ 5 = 8 d) 49 ÷ 7 = 7 e) 63 ÷ 9 = 7

2. Complete the chart for the arrays.

a)
X X X X X X
X X X X X X
X X X X X X
X X X X X X
X X X X X X

b)
X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X
X X X X X X X X

c)
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X
X X X X X X X X X

Array	Number of rows	Number of columns	Multiplication sentence	Division sentence	Division sentence	Number pairs
a)						(30,5) (30,6)
b)						
c)						

3. Write 2 division sentences for each multiplication sentence.

a) 3 × 7 = 21 b) 4 × 8 = 32 c) 9 × 5 = 45 d) 8 × 7 = 56 e) 9 × 8 = 72

4. Write a multiplication sentence and 2 division sentences for each pair of numbers.

a) (7, 4) b) (3, 6) c) (5, 4) d) (6, 9) e) (7, 5) f) (4, 8)
g) (6, 5) h) (5, 8) i) (3, 9) j) (7, 8) k) (9, 4) l) (8, 9)

5. How many times is the second number contained in the first?

a) (45, 9) b) (24, 3) c) (27, 9) d) (32, 8) e) (42, 7) f) (54, 6)
g) (49, 7) h) (21, 3) i) (25, 5) j) (36, 6) k) (63, 9) l) (72, 8)
m) (64, 8) n) (56, 7) o) (48, 8) p) (54, 9) q) (81, 9) r) (100, 10)

Long Division

Divide 56 by 4.
We need to find how many times 4 is contained in 56.

56 ÷ 4 can be also written $4\overline{)56}$.

You know the division facts to 100 ÷ 10.
You know how to multiply a number by 10.
Use these ideas to help you divide.

$$\begin{array}{r|rl} 4\overline{)56} & & \\ 40 & 10 & \uparrow \\ \cline{1-1} 16 & & \text{Add} \\ 16 & 4 & \\ \cline{1-2} 0 & 14 & \end{array}$$

How many fours in 56?
There are at least 10, because 10 × 4 = 40
56 − 40 = 16
How many fours in 16?
56 ÷ 4 = 14

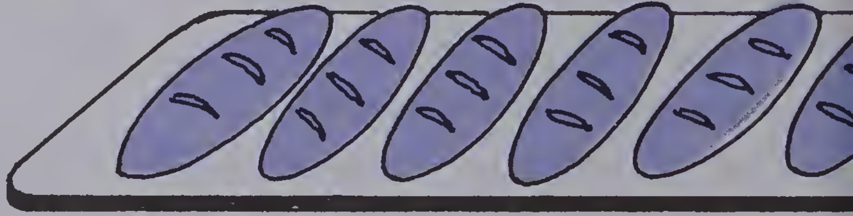
IN ACTION

Write the division question and the answer.

1. 60 books, 6 shelves
   How many books
   are on each shelf?

2. 72 chairs, 9 rows
   How many chairs
   are in each row?

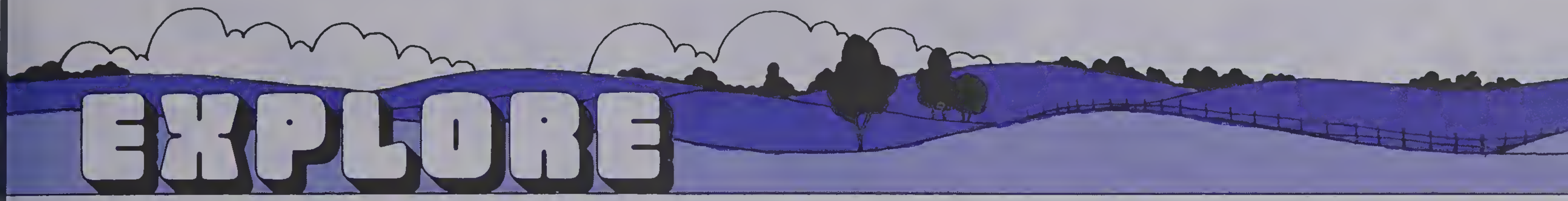
3. 96 loaves of bread,
   8 baking trays
   How many loaves
   are in each tray?



4. Complete.

a) $7\overline{)84}$ b) $6\overline{)96}$ c) $5\overline{)95}$ d) $4\overline{)72}$ e) $8\overline{)96}$ f) $9\overline{)99}$

g) $3\overline{)87}$ h) $7\overline{)91}$ i) $8\overline{)88}$ j) $6\overline{)90}$ k) $4\overline{)92}$ l) $5\overline{)85}$



EXPLORE

Long Division / Remainders

Divide 86 by 4.

$$\begin{array}{r|r l}
✓\ 4)\overline{86} & & \text{How many fours in 86?}\\
40 & 10 & \\
\hline
46 & & \text{How many fours in 46?}\\
40 & 10 & \\
\hline
6 & & \text{How many fours in 6?}\\
4 & 1 & \\
\hline
2 & 21 & \text{2 is left over.}
\end{array}$$

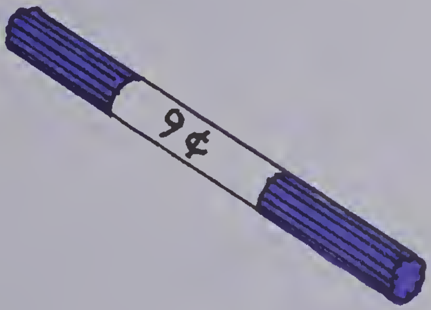
86 ÷ 4 is 21 **remainder 2** or 21R2

IN ACTION

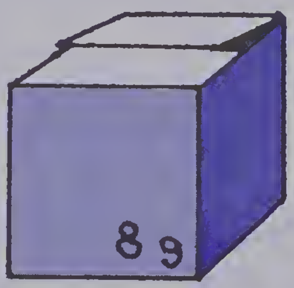
1. Divide.
   a) 75 by 8 b) 83 by 9 c) 86 by 7 d) 49 by 5 e) 74 by 6
   f) 94 by 4 g) 77 by 6 h) 62 by 3 i) 83 by 5 j) 97 by 7

2. Find the answers.
   a) 79 ÷ 7 b) 81 ÷ 4 ✓ c) 97 ÷ 6 d) 89 ÷ 6 e) 87 ÷ 5 f) 99 ÷ 8
   g) 91 ÷ 4 ✓ h) 105 ÷ 6 ✓ i) 103 ÷ 9 j) 125 ÷ 8 k) ✓ 114 ÷ 7 l) 118 ÷ 5

3. You have 85¢.
   A licorice stick
   costs 9¢.
   How many sticks
   can you buy?
   How much money
   will you have left?



4. The boxes have
   a total mass of 120 g.
   Each box
   has a mass of 8 g.
   How many boxes
   are there?



5. The bicycle shop has 150 wheels. The mechanic has the same number of front wheels as rear wheels. How many bicycles can he put together?

Retrace Your Steps

1. a) List the first 10 multiples of 4 that are greater than 0.
   List the first 10 multiples of 5 that are greater than 0.
   Circle the first number that appears in both lists.
   b) Repeat this procedure for the multiples of 6 and 7.

2. For each number pair, record the product.
   a) (4, 20) b) (3, 50) c) (40, 7) d) (60, 8) e) (9, 40) f) (7, 70)
   g) (6, 70) h) (8, 30) i) (70, 5) j) (90, 4) k) (80, 7) l) (60, 9)

3. Complete, to find the product.

a)
$$\begin{aligned} 8 \times 14 &= 8 \times (10 + 4) \\ &= (8 \times 10) + (8 \times ?) \\ &= \quad ? \quad + \quad ? \\ &= \qquad ? \end{aligned}$$

b)
$$\begin{aligned} 7 \times 18 &= 7 \times (10 + 8) \\ &= (7 \times ?) + (7 \times ?) \\ &= \quad ? \quad + \quad ? \\ &= \qquad ? \end{aligned}$$

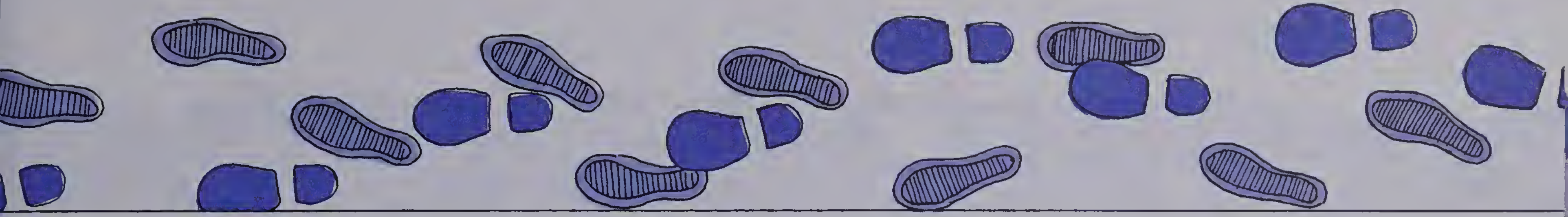
c)
$$\begin{aligned} 6 \times 19 &= 6 \times (10 + 9) \\ &= (? \times ?) + (? \times ?) \\ &= \quad ? \quad + \quad ? \\ &= \qquad ? \end{aligned}$$

4. Use the method in Question 3 to find the products.
   a) 8 × 15 b) 7 × 16 c) 6 × 16 d) 5 × 13 e) 9 × 19 f) 4 × 17
   g) 30 × 12 h) 40 × 14 i) 60 × 17 j) 20 × 19 k) 50 × 16 l) 90 × 12
   m) 70 × 13 n) 80 × 15 o) 90 × 11 p) 60 × 18 q) 40 × 19 r) 50 × 14

5. Estimate, and then find the product. Use the method shown in part a).
   a) 83 × 7
   Since 83 is about 80,
   then 83 × 7 is about 560

$$\begin{array}{r} 83 \\ 7 \\ \hline 21 \\ 560 \\ \hline 581 \end{array}$$

   b) 46 × 8 c) 72 × 6 d) 81 × 8
   e) 53 × 4 f) 47 × 3 g) 92 × 6
   h) 29 × 9 i) 31 × 7 j) 64 × 5
   k) 83 × 6 l) 59 × 8 m) 71 × 9
   n) 68 × 7 o) 96 × 4 p) 39 × 9



6. Estimate, and then find the product.
Use the ordinary multiplication form.

a) 74 × 3 b) 83 × 4 c) 24 × 6 d) 35 × 5 e) 45 × 6 f) 64 × 7
g) 56 × 4 h) 37 × 6 i) 48 × 3 j) 63 × 8 k) 59 × 3 l) 28 × 5
m) 72 × 8 n) 67 × 5 o) 88 × 6 p) 98 × 7 q) 87 × 9 r) 32 × 4

7. How many times is the second number contained in the first?

a) (35, 5) b) (27, 9) c) (42, 7) d) (18, 9) e) (48, 8) f) (36, 6)
g) (54, 9) h) (64, 8) i) (72, 9) j) (1, 1) k) (10, 1) l) (81, 9)

8. Complete the division.

a) $\begin{array}{r|l} 6\overline{)87} & \\ 60 & 10 \\ \cline{1-1} 27 & \end{array}$ b) $\begin{array}{r|l} 5\overline{)73} & \\ 50 & 10 \\ \cline{1-1} & \end{array}$ c) $\begin{array}{r|l} 7\overline{)93} & \\ & 10 \\ & \end{array}$ d) $\begin{array}{r|l} 4\overline{)97} & \\ 80 & 20 \\ \cline{1-1} 17 & \end{array}$ e) $\begin{array}{r|l} 8\overline{)170} & \\ & 20 \\ & \end{array}$

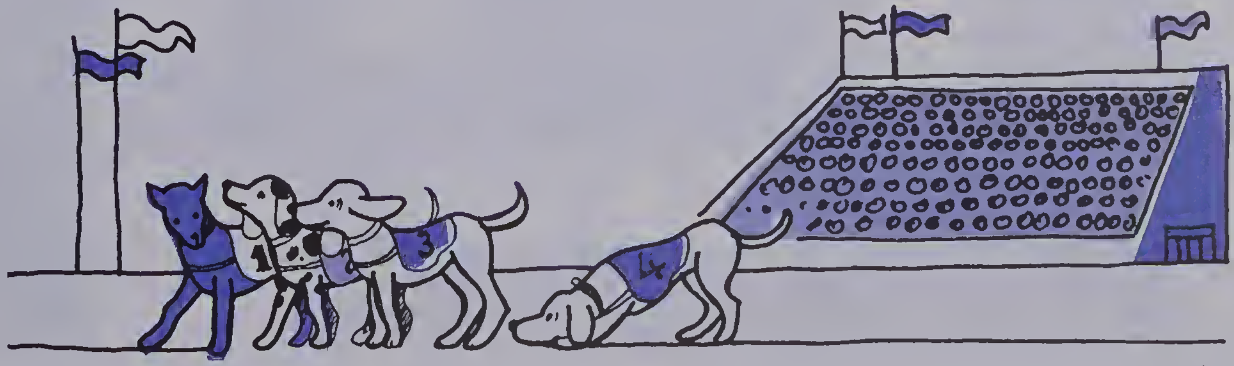
f) $8\overline{)99}$ g) $4\overline{)92}$ h) $9\overline{)98}$ i) $7\overline{)83}$ j) $5\overline{)102}$
k) $6\overline{)93}$ l) $9\overline{)136}$ m) $8\overline{)125}$ n) $4\overline{)110}$ o) $6\overline{)130}$

9. In a conservation area, the Wolf Cubs planted 40 evergreen trees in each of 19 rows. How many trees did they plant?

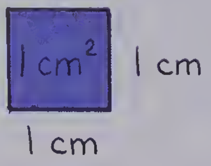
10. There are 85 books on 5 shelves. There are the same number of books on each shelf. How many books are on each shelf?

11. There are 96 chairs in the music room. There are 6 rows of chairs. How many chairs are in each row?

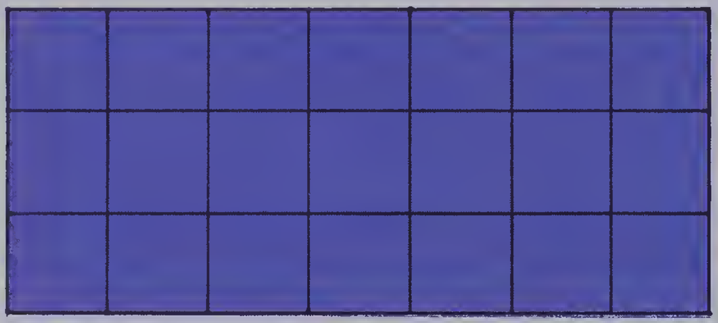
12. 90 dogs were entered in the Dog Derby. 6 dogs ran in each race. How many races were there?



Area



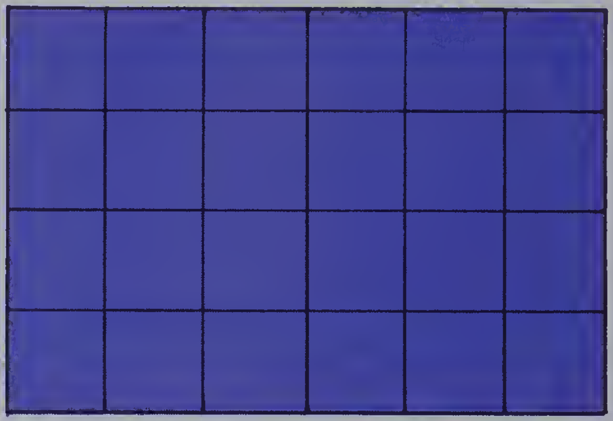
This square shape has an area of 1 cm² (1 square centimetre).



What is the area of the rectangular shape?

Count the squares to find the area.

The area is 21 cm².

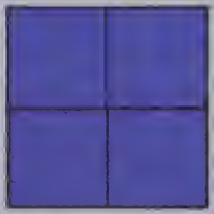


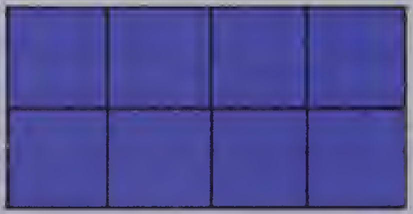
Here is another rectangular shape. What is its area?

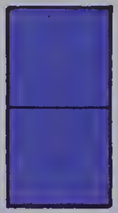
Can you think of an easier way than counting to find the area of a rectangular shape?

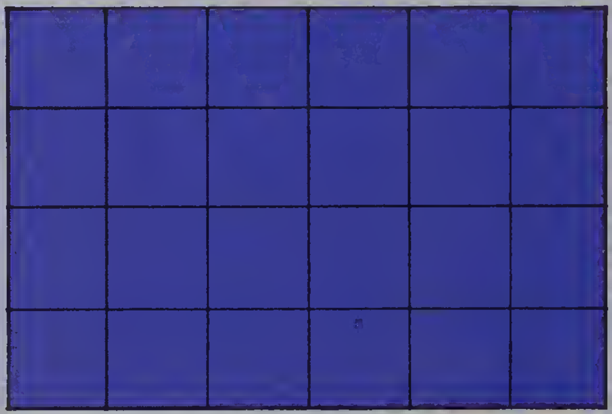
IN ACTION

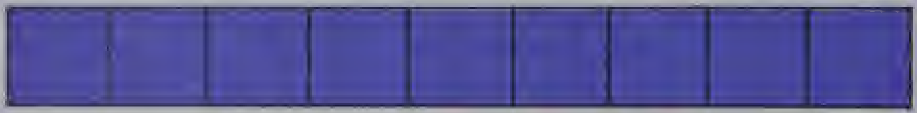
1. What is the area of each rectangular shape?

a) 

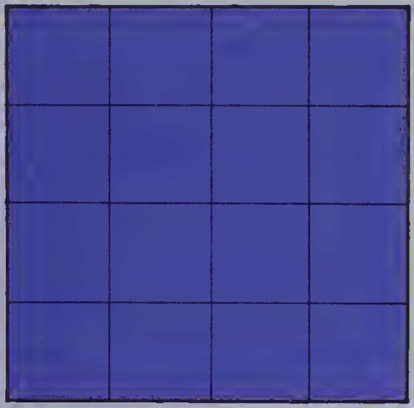
b) 

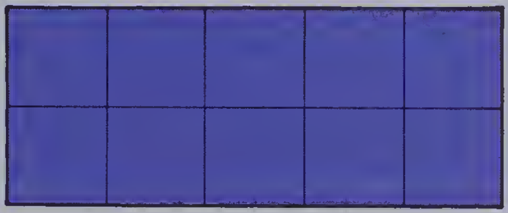
c) 

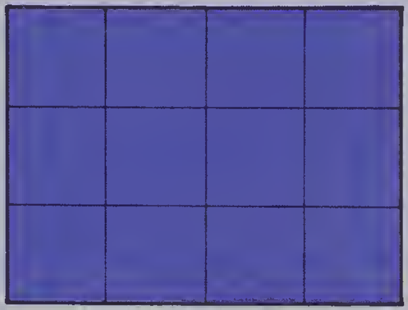
d) 

e) 

2. What is the area of each rectangular shape?
List the shapes in order from greatest area to least area.

a)


b)


c)


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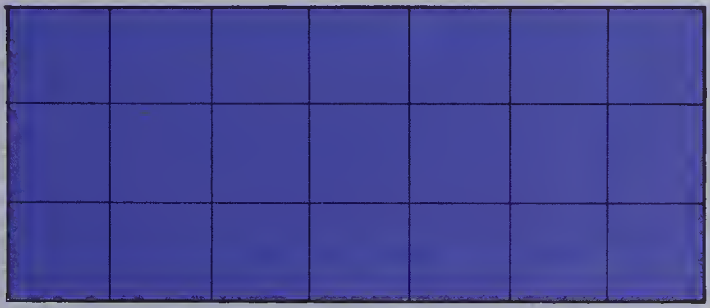
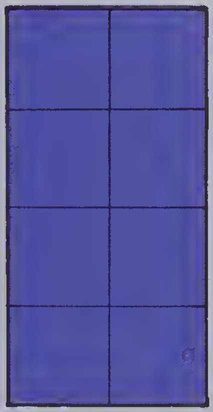
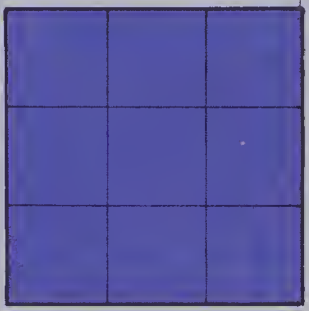
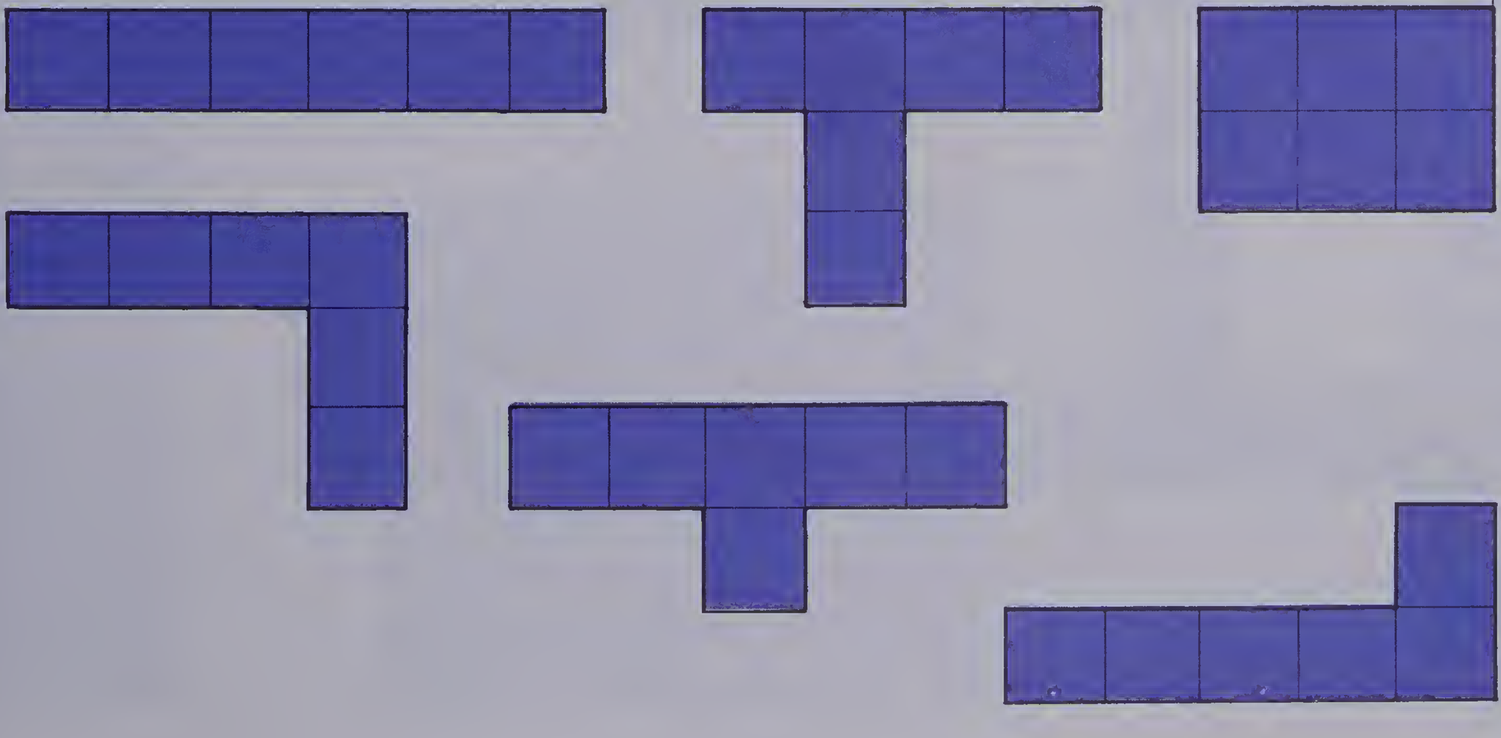


e)


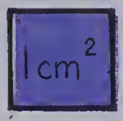
f)


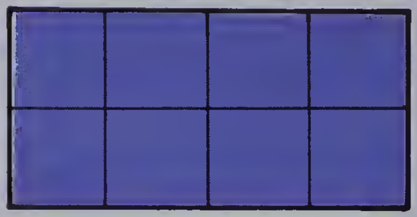
3. Investigate the shapes.
What do you find?
On graph paper, draw 2 other shapes which belong to the set.



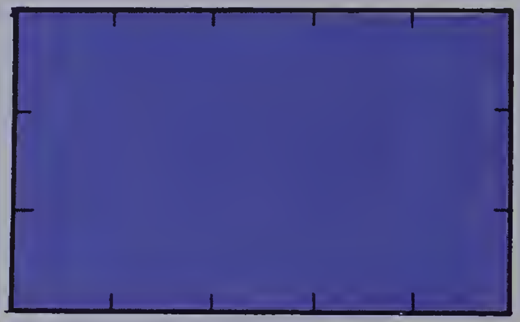
EXPLORE

Area cm^2





Area = (4 × 2) cm^2
= 8 cm^2

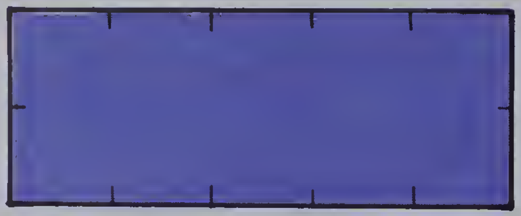


Area = (5 × 3) cm^2
= 15 cm^2

IN ACTION

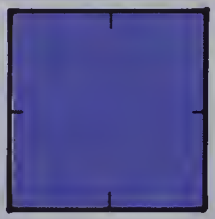
1. Complete.

a)



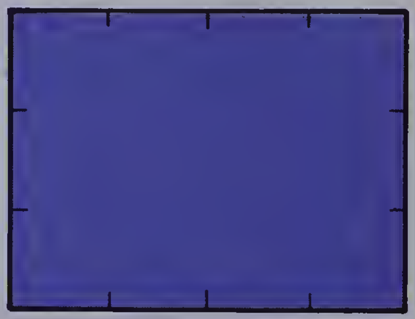
Area = (5 × 2) cm^2
= ? cm^2

b)



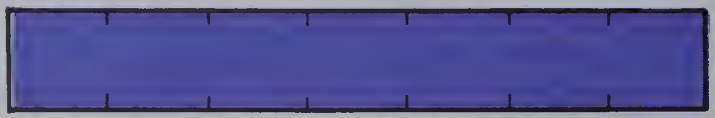
Area = (2 × 2) cm^2
= ? cm^2

c)



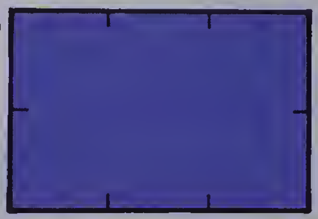
Area = (4 × ?) cm^2
= ?

d)



Area = (7 × ?) cm^2
= ?

e)

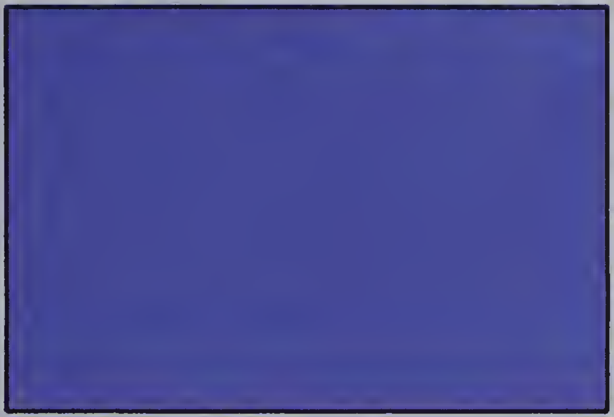


Area = (? × ?) cm^2
= ?

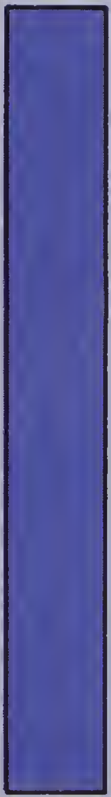
2. Make a chart like this one in your notebook.

Shape	Estimate			Measurement		
	Length (cm)	Width (cm)	Area (cm²)	Length (cm)	Width (cm)	Area (cm²)
a)						

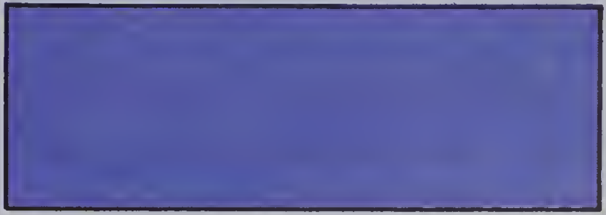
a)



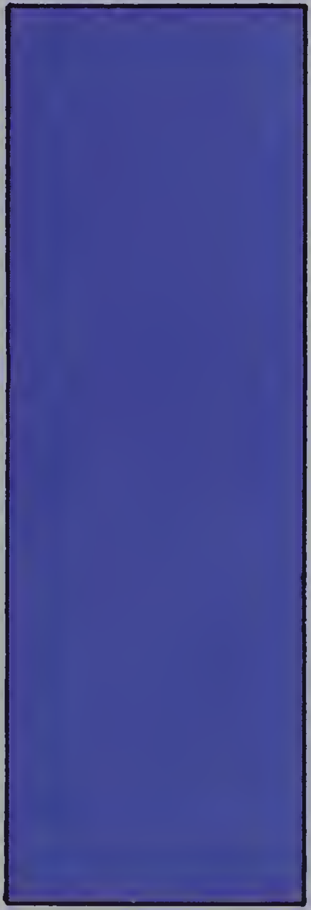
b)



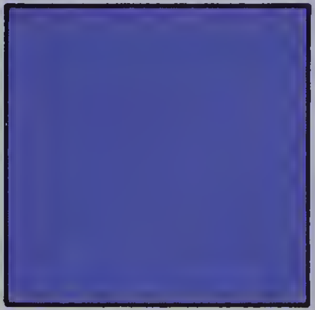
c)



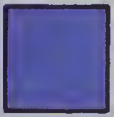
d)



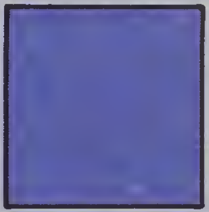
e)



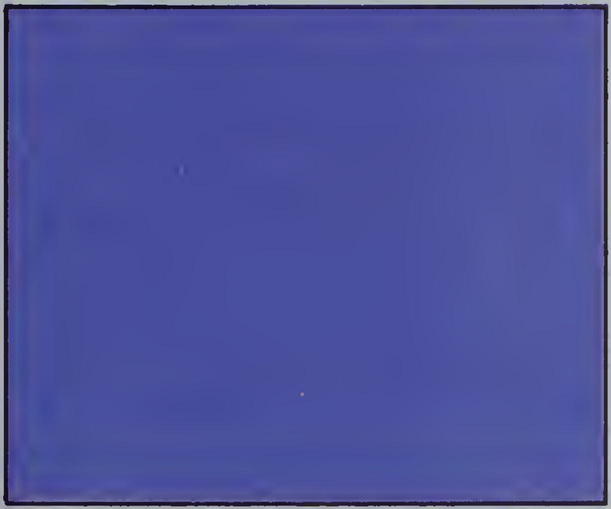
f)



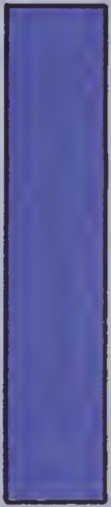
g)



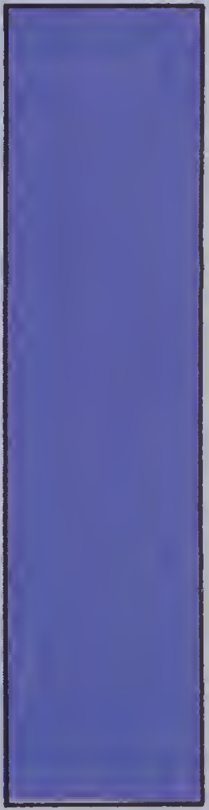
h)



i)

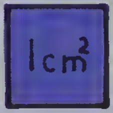


j)

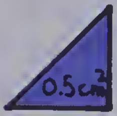


Half-Squares

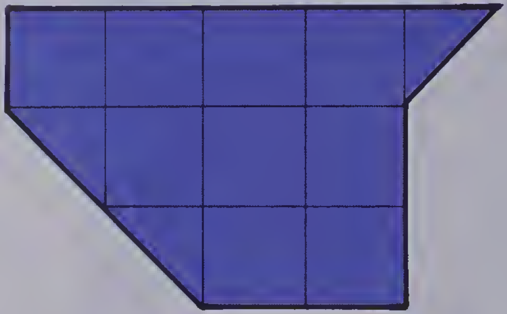
This square has an area of 1 cm².



This shape has an area of 0.5 cm².



Find the area of this shape.
Count squares and half-squares.



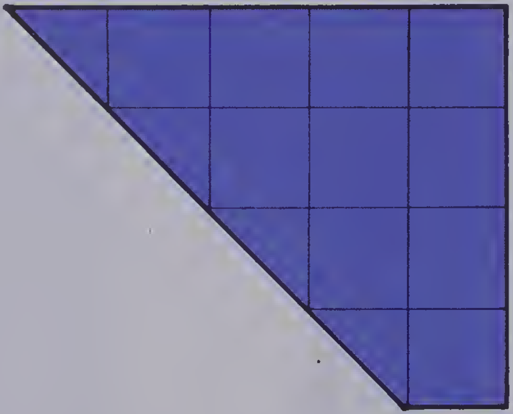
Did you write the area like this?

Area = 10.5 cm²

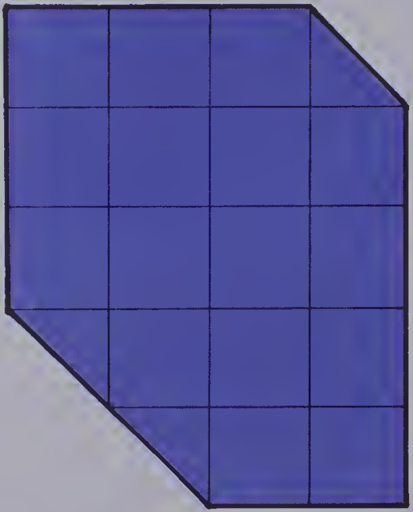
IN ACTION

1. Find the area of each shape.

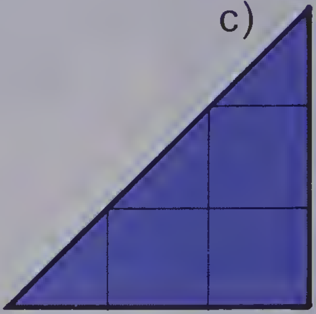
a)



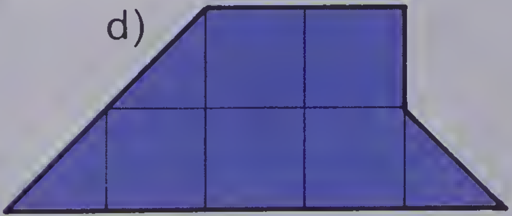
b)



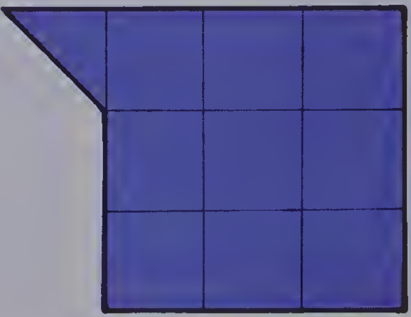
c)



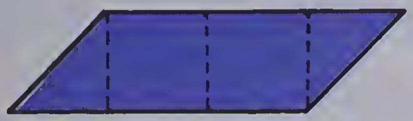
d)



e)



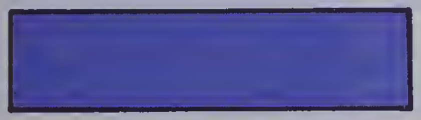
2. On 1 cm graph paper,
draw as many shapes as you can
which have an area of 3 cm^2.
By using half-squares,
you can make your shapes very interesting.



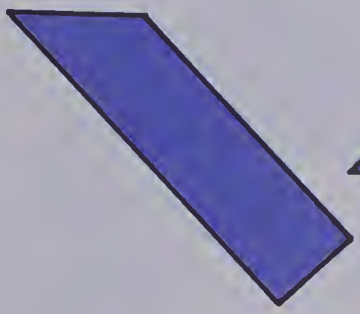
3 cm^2

3. Which shapes have an area of 4 cm^2?
To help you decide, cut out four 1 cm squares
from graph paper.

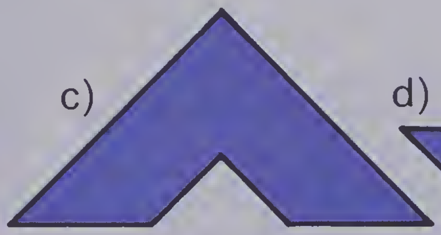
a)



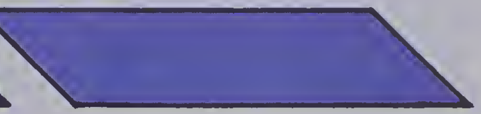
b)



c)



d)



4. On 1 cm graph paper, draw shapes that have these areas.
   - a) 10.5 cm^2
   - b) 14 cm^2
   - c) 5.5 cm^2
   - d) 4.5 cm^2
   - e) 16.5 cm^2
   - f) 18 cm^2
   - g) 12.5 cm^2
   - h) 6 cm^2
   - i) 3.5 cm^2

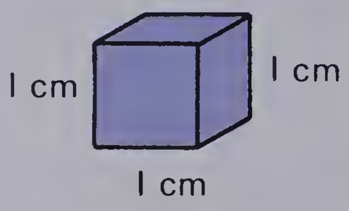
5. Draw as many different shapes as you can
with an area of 12 cm^2.

6. Draw several different shapes,
each with an area of 8.5 cm^2.
Compare your shapes
with the shapes drawn by a friend.

The Cubic Centimetre

Here is a cube.

It is 1 cm long, 1 cm wide, and 1 cm high.

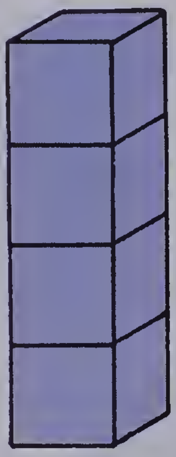


1 cm³

Its volume is 1 cm³ (1 cubic centimetre).

Here is a structure made with four 1 cm cubes.

Its volume is 4 cm³.



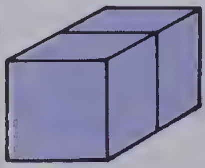
4 cm³

How many different structures can you make using four 1 cm cubes?

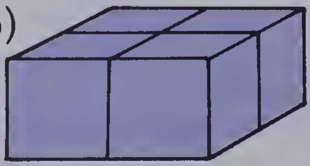
What is the volume of each structure?

These structures are made with 1 cm cubes.
What is the volume of each one?

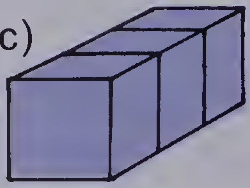
a)



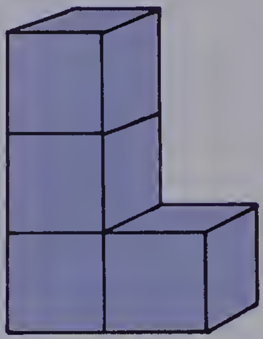
b)



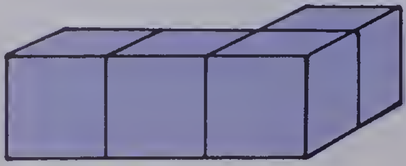
c)



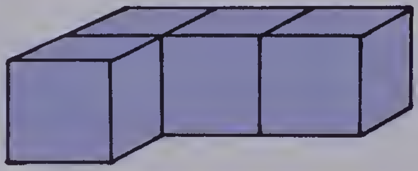
d)



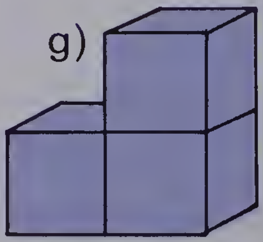
e)



f)

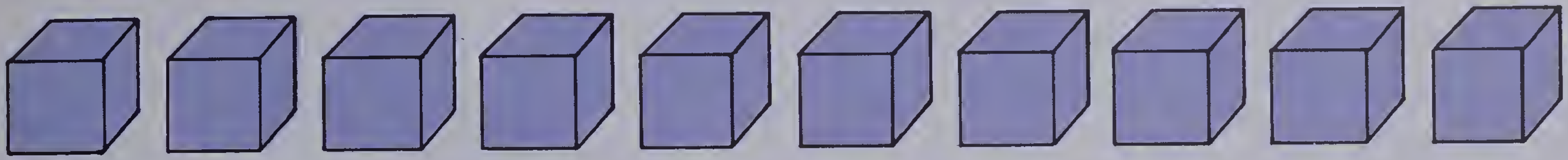


g)



IN ACTION

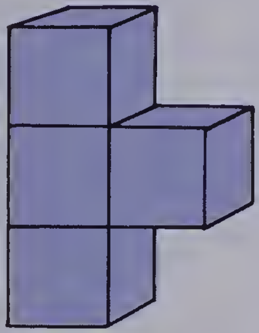
1. Use a set of ten 1 cm cubes.



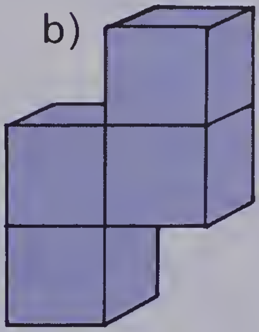
Make 5 different structures with them.
What is the volume of each one?

2. What is the volume of each structure?
Each cube is 1 cm^3.

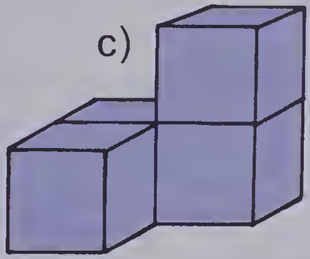
a)



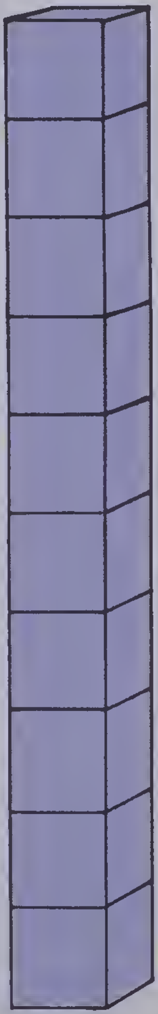
b)



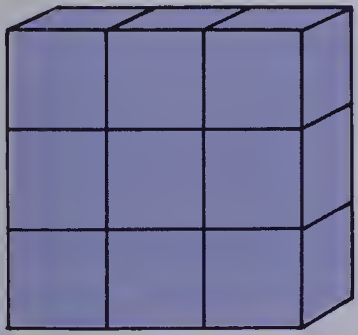
c)



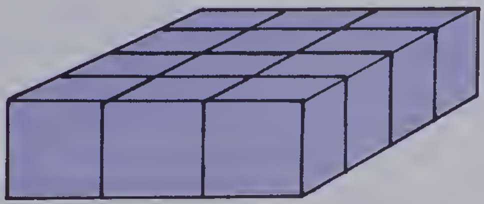
d)



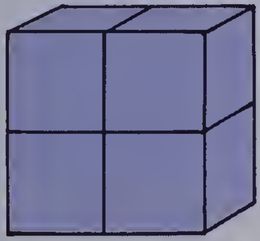
e)



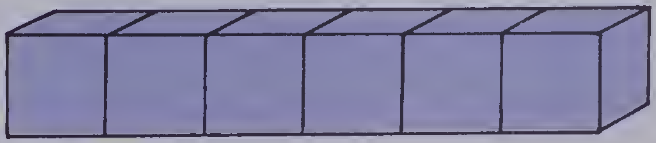
f)



g)



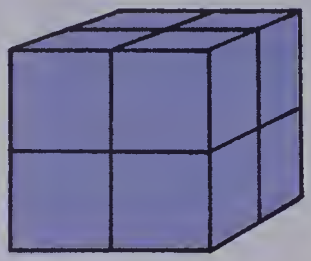
h)



Hidden Cubes!

Sometimes you can't see
all the cubes in a structure.

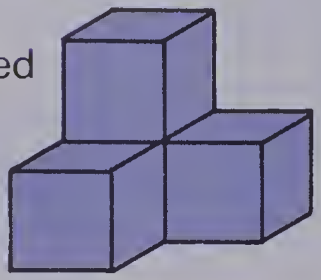
Use 1 cm cubes
to build this structure.



What is its volume?
How many cubes are hidden?

How many cubes have been removed
to make this structure?

How many cubes are hidden?



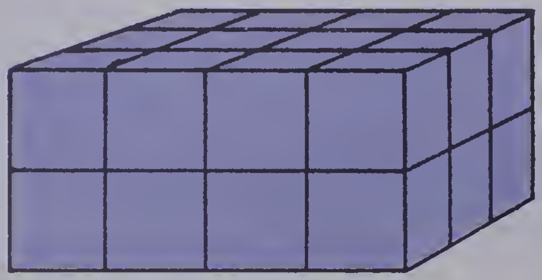
What is the volume
of the new structure?

Remember to think about hidden cubes!

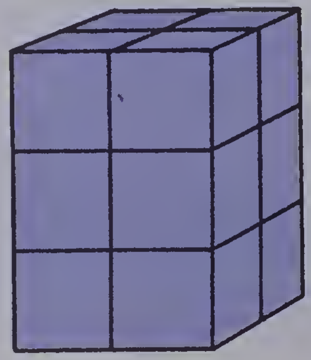
IN ACTION

1. Find the volume of each structure.
Each cube is 1 cm^3.

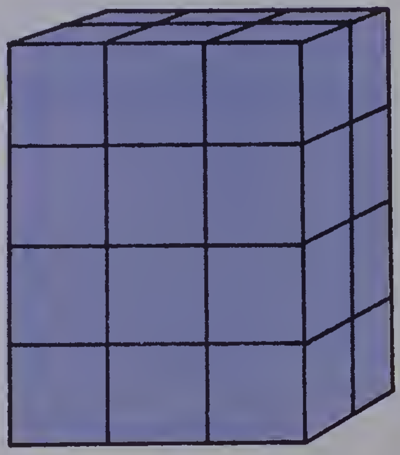
a)



b)

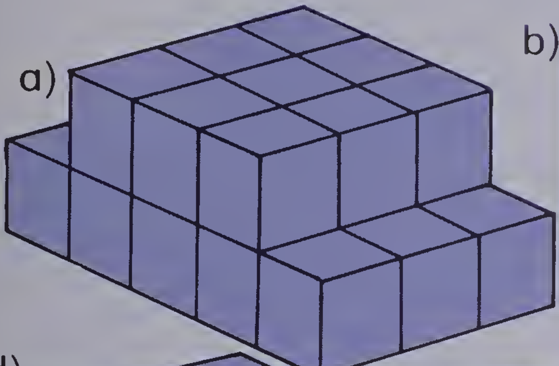


c)

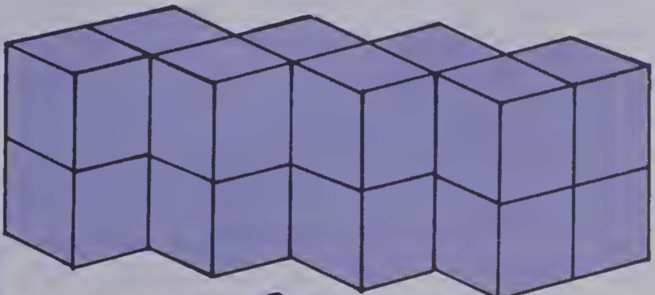


2. Find the volume of each structure.
Each cube is 1 cm³.

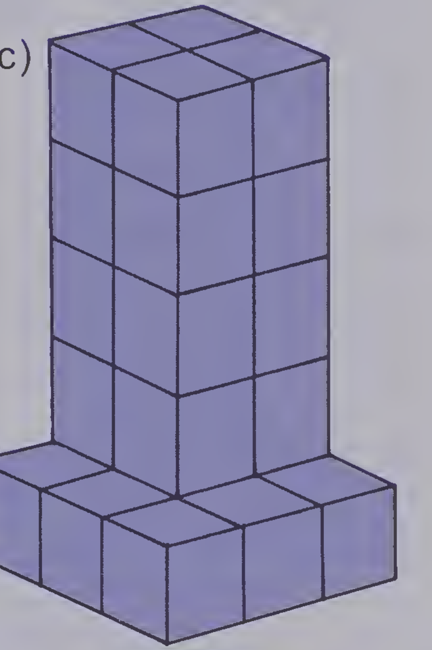
a)



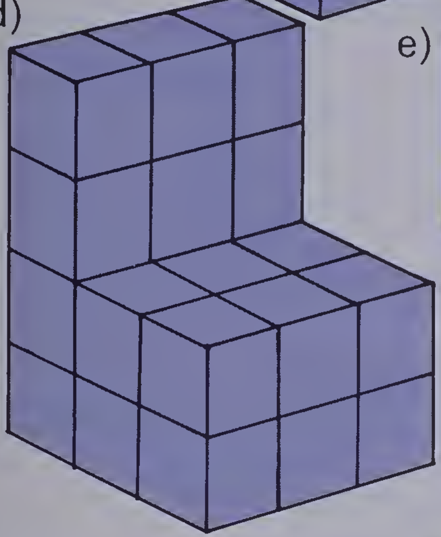
b)



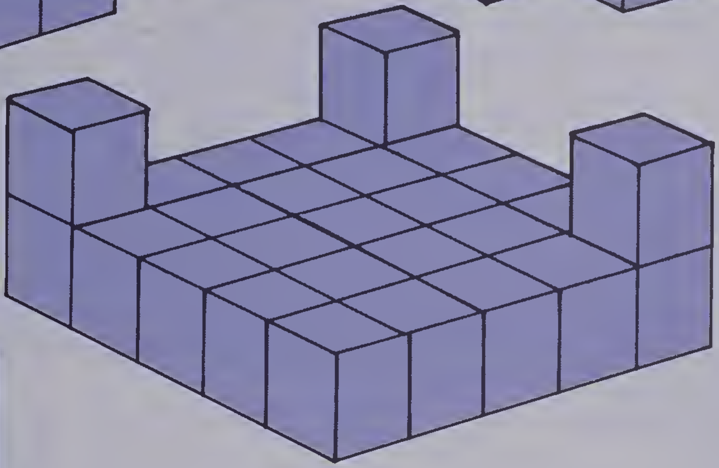
c)



d)

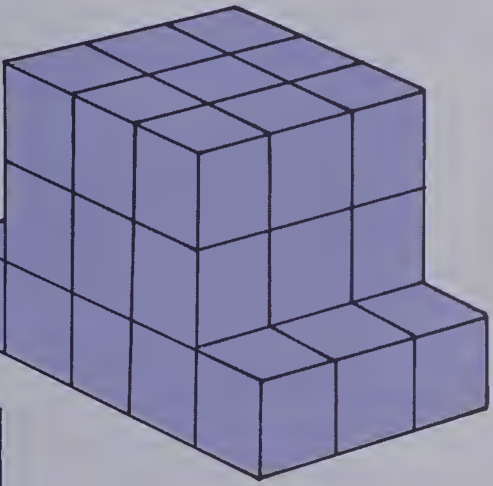


e)

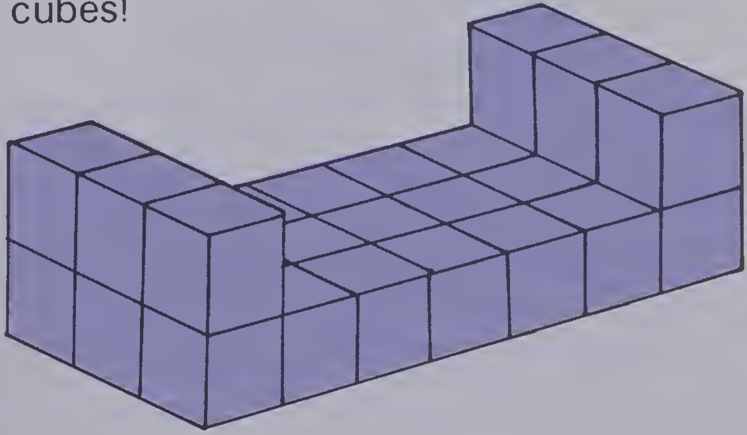


Think about hidden cubes!

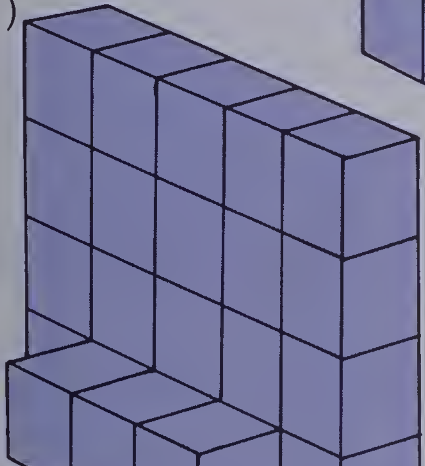
f)



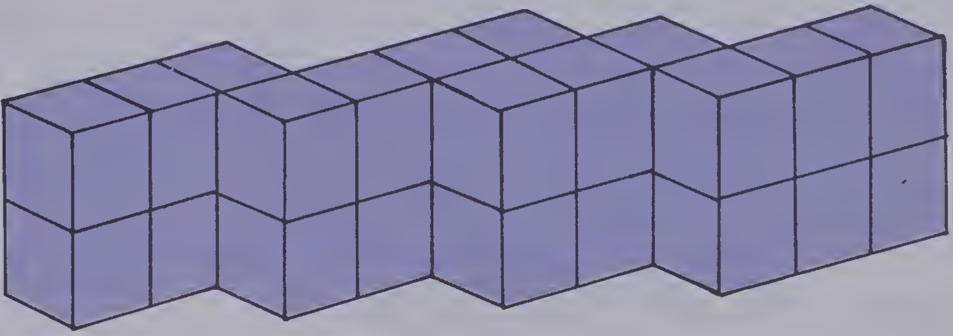
g)



h)



i)



Making Boxes

Pick a pattern
and make a cardboard box.

Fill your box with 1 cm cubes.

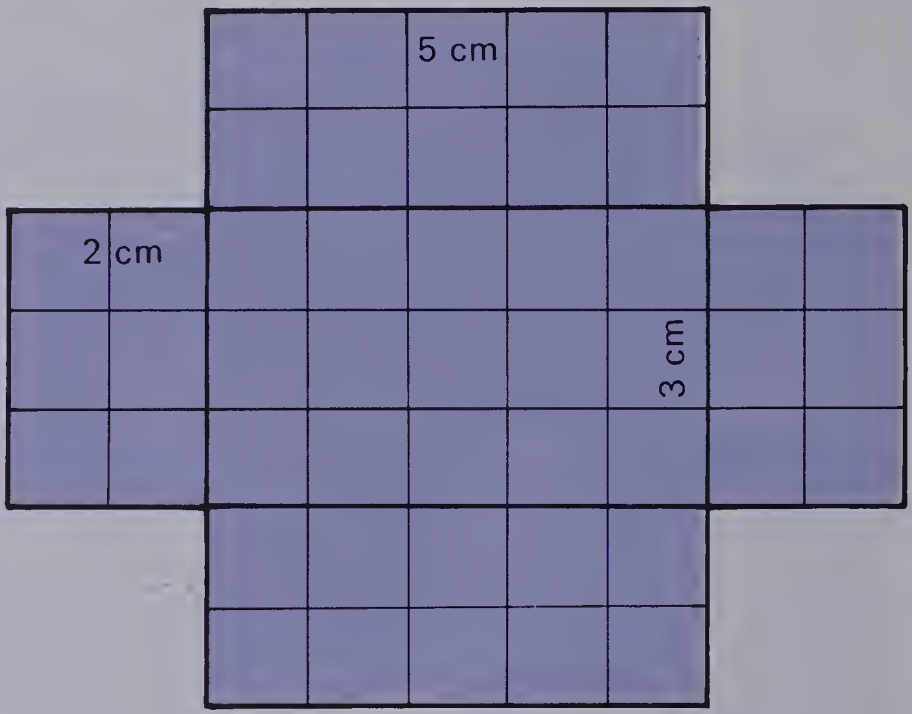
How many cubes
are in the first layer?

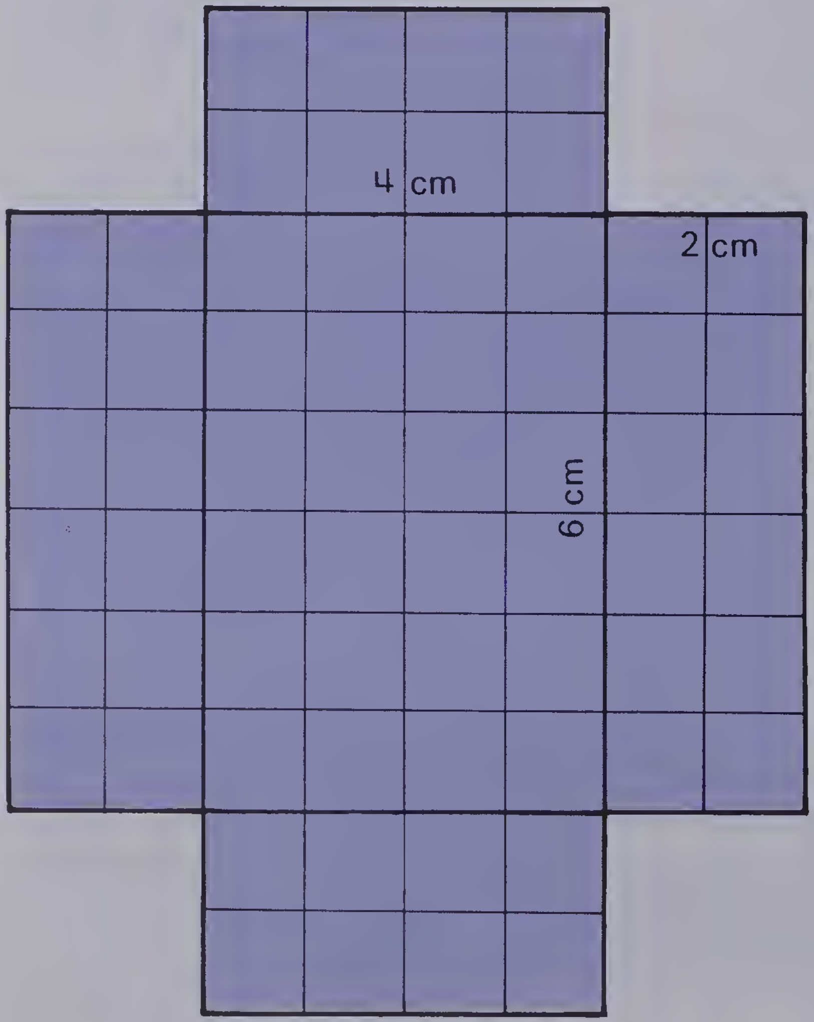
How many layers are there?

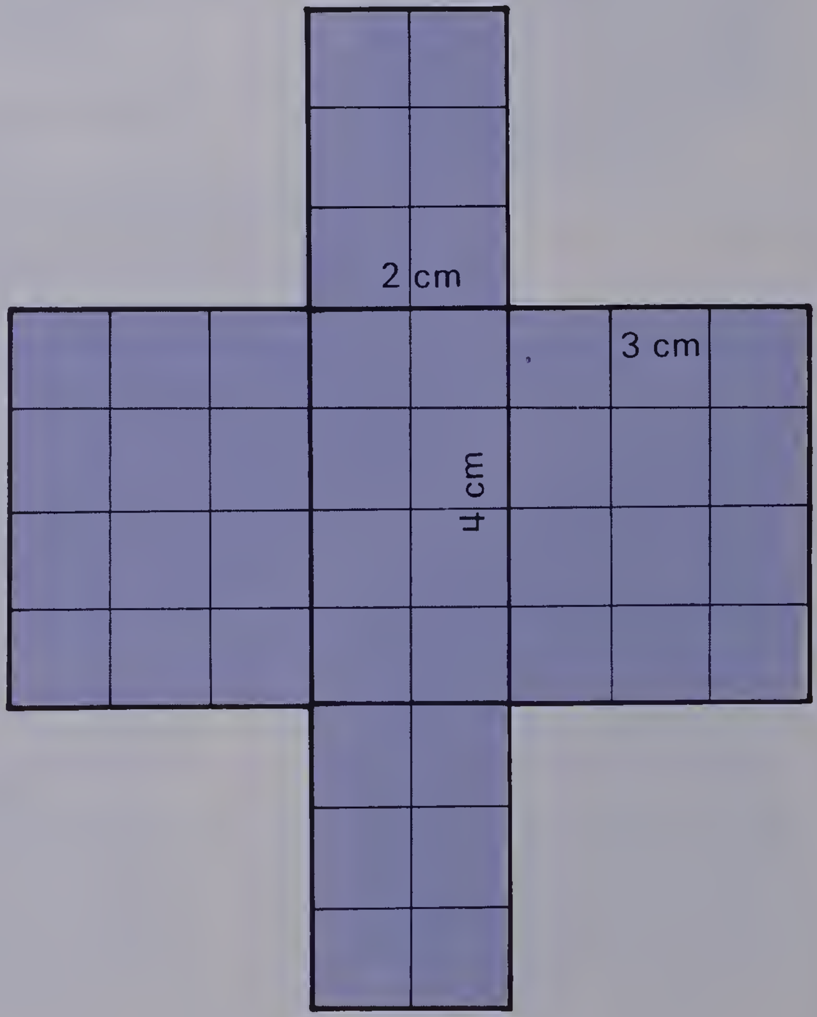
What is the volume of the box?

How many 1 cm cubes
would each of the other boxes hold?

What would be the volume
of each box?

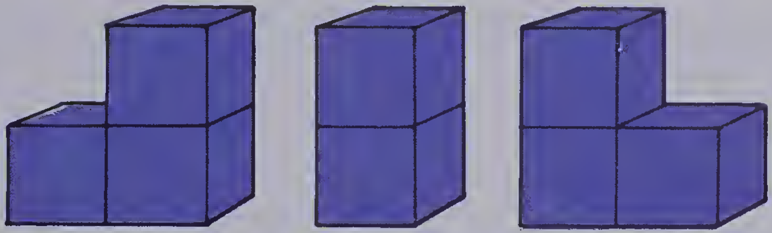






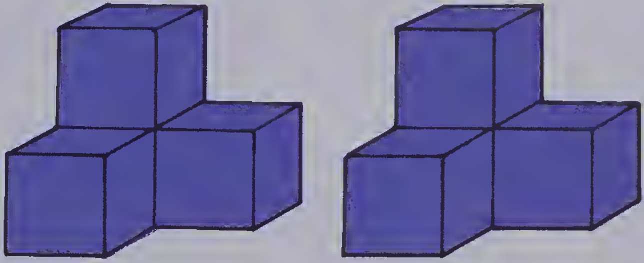
Cube Puzzles

Use 1 cm cubes that fit together
to make these 3 simple structures.
What is the volume of each structure?

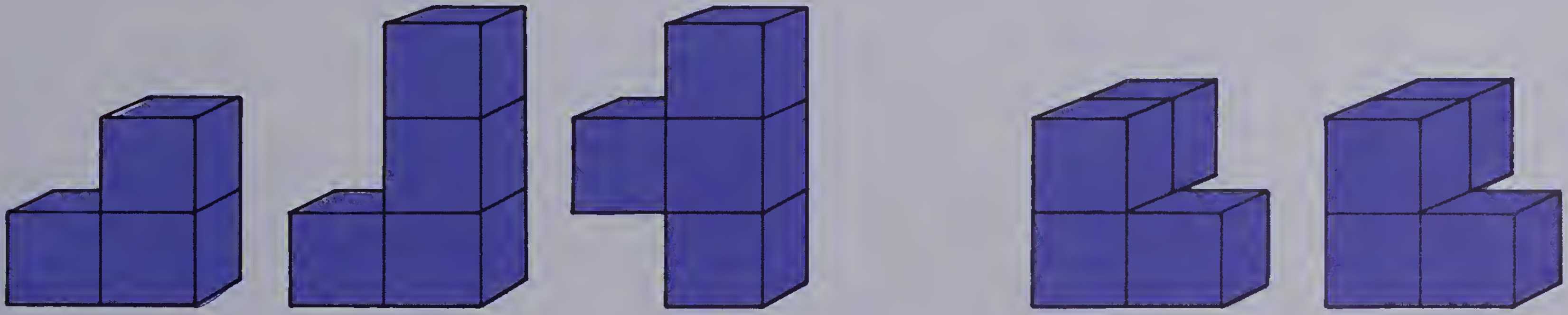


Fit the 3 structures together
to form a cube 2 cm long, 2 cm wide, and 2 cm high.
What is the volume of the cube?

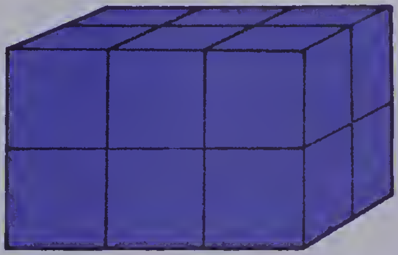
Now make these 7 simple structures.
What is the volume of each structure?



Fit the 7 structures together to form a cube
3 cm long, 3 cm wide, and 3 cm high.
What is the volume of the cube?



Build a prism 3 cm long, 2 cm wide,
and 2 cm high.
Separate it into 4 simple structures
with volume 3 cm³.
Give your puzzle pieces to a friend
to put together.



EXPLORE

The Cubic Metre m³

1

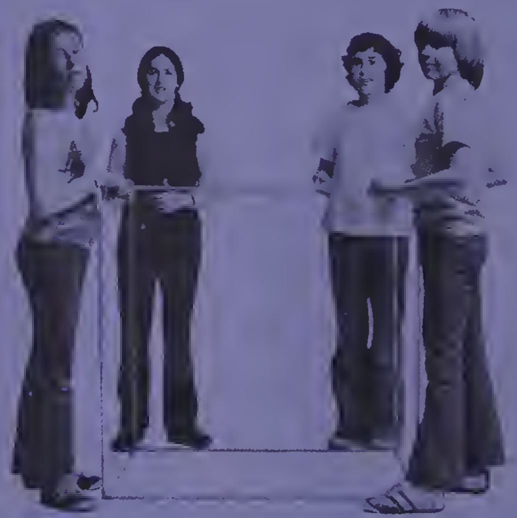
2

3

4

5

The cubic metre is 1 m long, 1 m wide, and 1 m high.



7

8

9

10

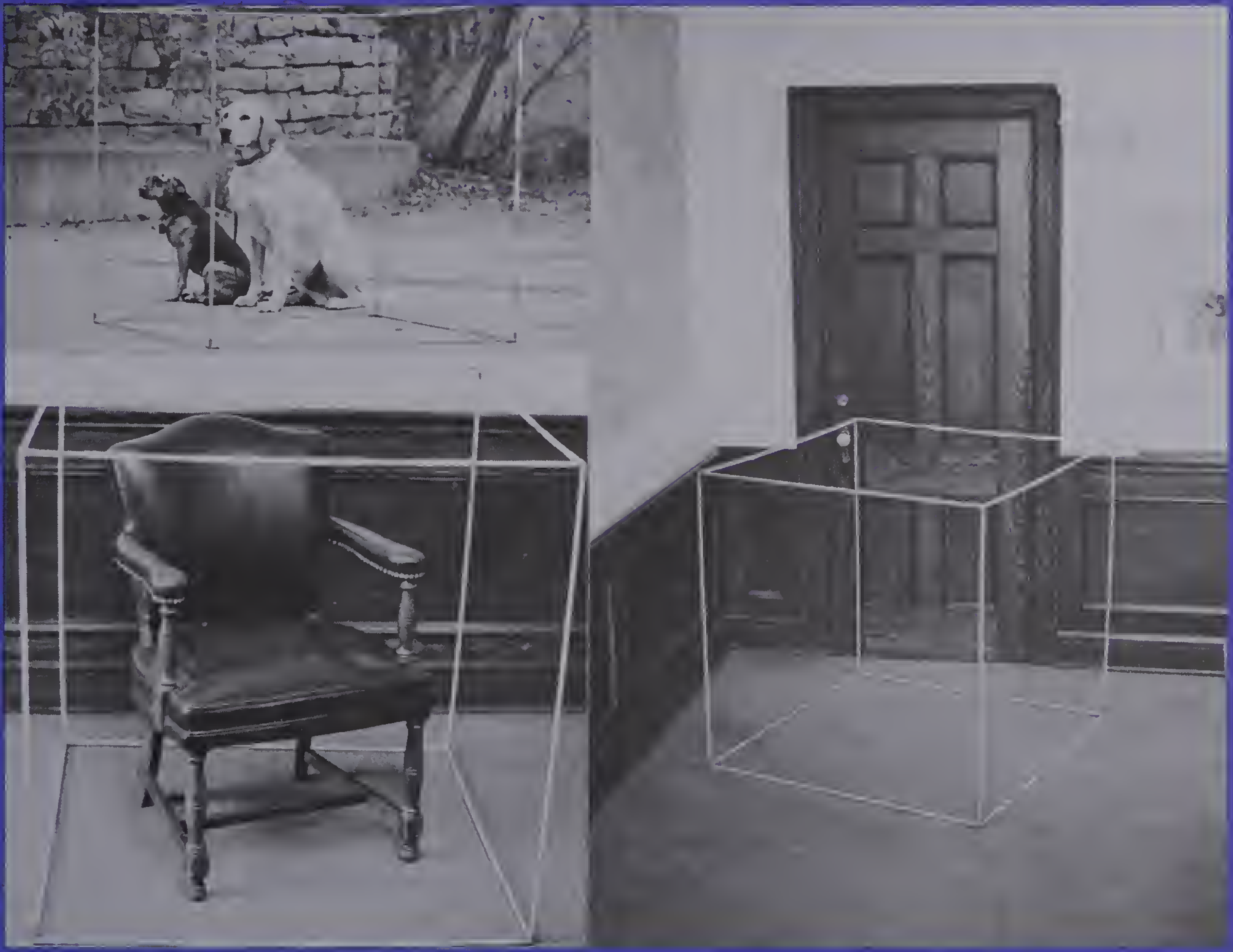
11

12

1. Illustrate a cubic metre by using 12 sticks, each 1 m long. You will need 3 people to help you.

3. Try to get a good concept of the size of 1 m^3. Compare your cubic metre with some spaces you know.

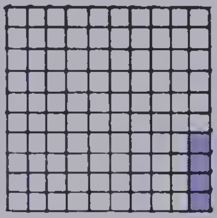
2. Construct a cubic metre. You may use metre sticks or any wooden rods, each 1 m in length. The ends of the sticks or rods may be drilled and the cubic metre tied together with string or wire.

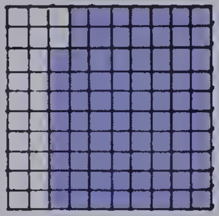


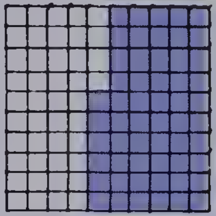
Unit 2, Check 1

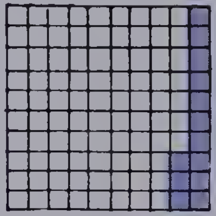
Check your understanding of place value with the answers at the bottom of the page.
If you are not happy with your work, do Practice 1 on page 161.

1. What fractions are represented? Write the decimals.

a)


b)


c)


d)


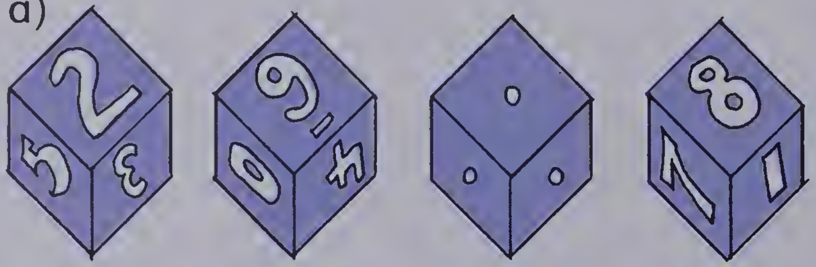
What numbers are represented?

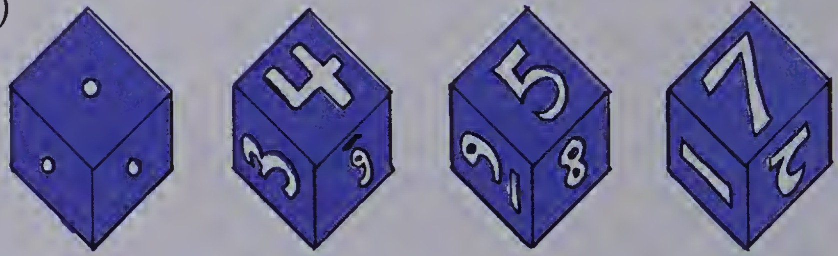
2. a) 1 one, 4 tenths, and 2 hundredths
   b) 4 ones, 2 tenths, and 5 hundredths
   c) 7 ones, 6 tenths, and 1 hundredth
   d) 0 ones, 5 tenths, and 8 hundredths

3. a) 2 + 0.3 + 0.07 b) 6 + 0.1 + 0.09 c) 5 + 0.0 + 0.04 d) 8 + 0.7 + 0.00
   e) 3 + 0.9 + 0.06 f) 9 + 0.8 + 0.03 g) 4 + 0.7 + 0.01 h) 6 + 0.3 + 0.00

4. What is the meaning of each coloured digit?
   a) 1.58 b) 8.16 c) 3.92 d) 0.45 e) 5.67 f) 7.29 g) 9.03
   h) 5.82 i) 4.29 j) 2.70 k) 0.81 l) 8.43 m) 1.97 n) 6.14

5. What numbers can you show?

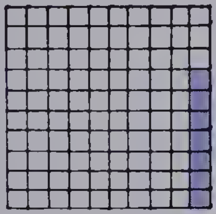
a)


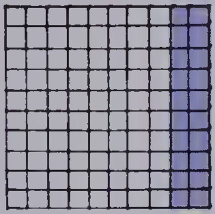
b)


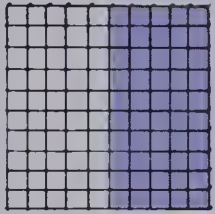
1. a) $\frac{4}{100}$, 0.04 b) $\frac{78}{100}$, 0.78 c) $\frac{56}{100}$, 0.56 d) $\frac{13}{100}$, 0.13
2. a) 1.42 b) 4.25 c) 7.61 d) 0.58
3. a) 2.37 b) 6.19 c) 5.04 d) 8.70 e) 3.96 f) 9.83 g) 4.71 h) 6.30
4. a) 5 tenths b) 6 hundredths c) 3 ones d) 5 hundredths e) 6 tenths
   f) 7 ones g) 0 tenths h) 2 hundredths i) 4 ones j) 7 tenths
   k) 1 hundredth l) 8 ones m) 9 tenths n) 4 hundredths
5. Answers will vary. Sample answers: a) 9.82, 29.8, 892 b) 45.7, 7.54, 547

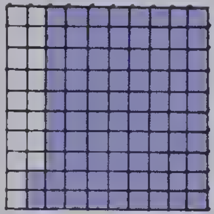
Practice I

1. Each part shows $\frac{1}{100}$. What fractions are represented?

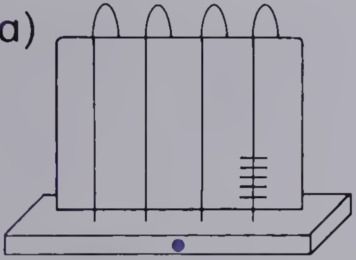
a) 

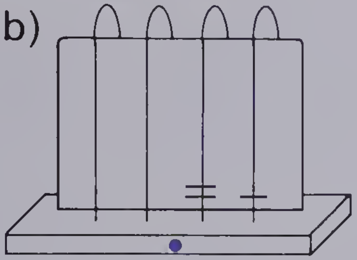
b) 

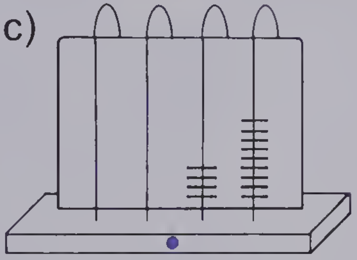
c) 

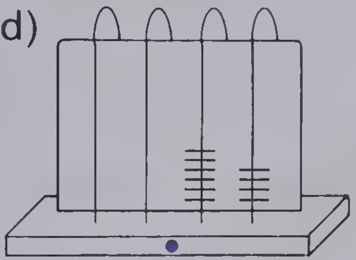
d) 

2. What decimals are represented?

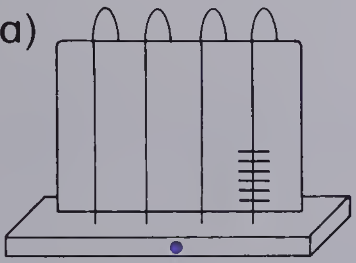
a) 

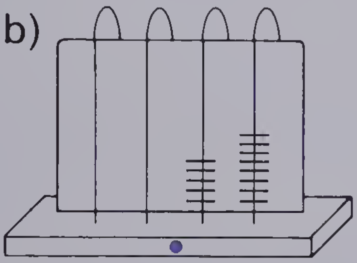
b) 

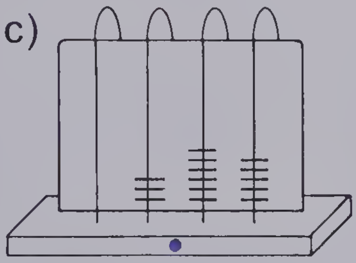
c) 

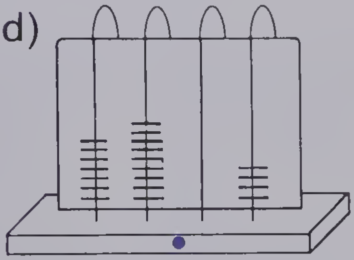
d) 

What numbers are represented?

3. a) 

b) 

c) 

d) 

4. a)

ONES	TENTHS	HUNDREDTHS
5	1	8

b)

ONES	TENTHS	HUNDREDTHS
2	7	3

c)

1	0.1	0.01
0	6	9

d)

1	0.1	0.01
4	8	1

e)

1	0.1	0.01
9	2	5

5. a) 1 one, 4 tenths, and 7 hundredths
b) 3 ones, 0 tenths, and 2 hundredths
c) 6 ones, 3 tenths, and 0 hundredths
d) 7 ones, 5 tenths, and 6 hundredths
e) 8 ones, 9 tenths, and 2 hundredths
f) 4 ones, 1 tenth, and 5 hundredths

6. a) 2 + 0.6 + 0.03 b) 0 + 0.2 + 0.01 c) 9 + 0.8 + 0.04 d) 5 + 0.7 + 0.09
e) 1 + 0.5 + 0.08 f) 6 + 0.4 + 0.06 g) 7 + 0.3 + 0.00 h) 8 + 0.00 + 0.07

7. Sort the numerals. Explain your sorting.

234 2 ones, 3 tenths, and 4 hundredths 20 + 3 + 0.4
2 + 0.3 + 0.04 23.4 2 hundreds, 3 tens, and 4
2 tens, 3 ones, and 4 tenths 200 + 30 + 4 2.34

Unit 2, Check 2

Check your skill at addition and subtraction.
Try Practice 2 on page 163 if you need more practice.

1. Add. Think the answers.

a) ↑	b)	c)	d)	e)	f)	g)	h)
2.7	5.4	1.8	5.7	0.6	2.4	6.6	3.5
3.4	3.9	3.6	2.9	4.6	1.8	0.9	3.7

2. Subtract. Think the answers.

a) ↓	b)	c)	d)	e)	f)	g)	h)
6.2	5.3	7.2	6.1	4.2	7.3	8.4	6.4
1.5	3.6	4.8	5.7	2.4	5.9	2.6	3.9

3. Add. Exchange 10 for 1.

a)	b)	c)	d)	e)	f)	g)	h)
0.94	4.85	3.77	2.62	0.78	2.57	1.18	7.85
1.96	4.95	0.83	6.59	7.68	2.97	1.92	1.38

4. Subtract. Exchange 1 for 10.

a)	b)	c)	d)	e)	f)	g)	h)
9.60	8.40	5.32	7.41	9.51	7.25	8.80	8.71
1.85	3.78	1.56	2.46	8.94	3.28	6.93	5.92

5. Complete the "Magic Squares" in your notebook.
The sum of the numbers in any straight line is always the same number.

a)

0.9	1.4	0.7
■	1.0	■
1.3	■	1.1

b)

1.4	■	1.6
■	1.3	■
■	■	1.2

c)

■	2.0	■
2.2	1.8	1.4
1.7	■	■

d)

0.41	■	■	0.38
■	0.35	0.36	0.33
■	0.31	0.32	■
0.29	0.40	■	0.26

1. a) 6.1 b) 9.3 c) 5.4 d) 8.6 e) 5.2 f) 4.2 g) 7.5 h) 7.2
2. a) 4.7 b) 1.7 c) 2.4 d) 0.4 e) 1.8 f) 1.4 g) 5.8 h) 2.5
3. a) 2.90 b) 9.80 c) 4.60 d) 9.21 e) 8.46 f) 5.54 g) 3.10 h) 9.23
4. a) 7.75 b) 4.62 c) 3.76 d) 4.95 e) 0.57 f) 3.97 g) 1.87 h) 2.79
5. Missing numbers: a) 0.8, 1.2, 0.6 b) 0.9, 1.5, 1.1, 1.0, 1.7
c) 1.5, 1.9, 1.6, 2.1 d) 0.28, 0.27, 0.30, 0.34, 0.37, 0.39

Practice 2

1. Regroup. Exchange 10 for 1.

a) 3 + 1.9 or ? + 0.9 or ?
b) 2 + 1.3 or 3 + ? or ?
c) 4 + ? or ? + ? or 5.7
d) ? + ? or 6 + 0.4 or ?

2. Regroup. Exchange 1 for 10.

a) 6.3 or 6 + ? or 5 + ?
b) 3.2 or ? + 0.2 or 2 + ?
c) 4.7 or ? + ? or ? + 1.7
d) ? or ? + 0.1 or 7 + 1.1

3. Add this way.

4.7
2.4
1.1
6.0
7.1

a) 0.8	b) 4.3	c) 5.5	d) 3.1	e) 0.7
2.6	1.9	0.5	4.9	8.7
f) 5.3	g) 2.9	h) 1.4	i) 4.9	j) 6.8
1.8	3.7	6.6	4.5	2.8

4. Subtract this way.

9.3 = 8 and 13 tenths
2.8 = 2 and 8 tenths
6.5 = 6 and 5 tenths

a) 2.1	b) 3.2	c) 1.5	d) 8.3
0.8	1.9	0.6	7.4
e) 5.6	f) 2.4	g) 7.7	h) 9.1
4.7	1.5	1.8	4.9

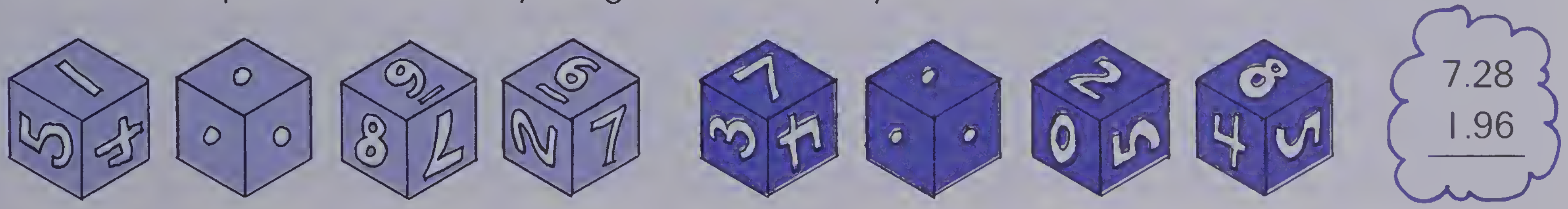
5. Add. Exchange 10 for 1 when you need to.

a) 3.83	b) 5.29	c) 1.61	d) 4.13	e) 3.74	f) 2.95	g) 7.52	h) 3.68
4.56	1.43	2.68	0.67	5.69	2.97	1.68	3.94

6. Subtract. Exchange 1 for 10 when you need to.

a) 4.15	b) 9.50	c) 3.08	d) 3.60	e) 6.51	f) 7.20	g) 4.67	h) 9.40
3.35	6.07	0.28	2.41	0.76	6.54	0.98	0.86

7. Use 4 dice like these to create your own addition and subtraction questions. Use only 1-digit numerals on your dice.



Unit 2, Check 3

Check your own work with multiplication and division.
If you need more help, see Practice 3 on page 165.

1. List the multiples of :
   a) 7, between 20 and 70　　b) 10, between 30 and 80

2. Use 10 to help you multiply.
   a) 8 × 16 = 8 × (10 + 6)　　b) 5 × 12 = 5 × (10 + ?)
   c) 9 × 17 = 9 × (? + ?)　　d) 3 × 17　　e) 7 × 13　　f) 4 × 16
   g) 8 × 14　　h) 6 × 18　　i) 9 × 15

3. Find the products.
   a) 6 × 80　　b) 9 × 60　　c) 5 × 70　　d) 8 × 50　　e) 4 × 90　　f) 7 × 40
   g) 30 × 15　　h) 70 × 17　　i) 40 × 12　　j) 80 × 16　　k) 50 × 18　　l) 90 × 14

4. Estimate the answers.
   a) 6 × 72　　b) 4 × 69　　c) 8 × 31　　d) 7 × 58　　e) 5 × 43　　f) 9 × 88

5. Estimate, then find the products.

a) 64	b) 27	c) 71	d) 39	e) 82	f) 46	g) 93	h) 58
3	8	4	9	7	5	9	6

6. Divide.
   a) $4\overline{)271}$　　b) $5\overline{)273}$　　c) $9\overline{)299}$　　d) $6\overline{)232}$　　e) $8\overline{)445}$　　f) $7\overline{)327}$

1. a) 21, 28, 35, 42, 49, 56, 63, 70　　b) 30, 40, 50, 60, 70, 80
2. a) 128　b) 60　c) 153　d) 51　e) 91　f) 64　g) 112　h) 108　i) 135
3. a) 480　b) 540　c) 350　d) 400　e) 360　f) 280
   g) 450　h) 1190　i) 480　j) 1280　k) 900　l) 1260
4. a) about 420　b) about 280　c) about 240　d) about 420　e) about 200　f) about 810
5. a) 192　b) 216　c) 284　d) 351　e) 574　f) 230　g) 837　h) 348
6. a) 67R3　b) 54R3　c) 33R2　d) 38R4　e) 55R5　f) 46R5

Practice 3

1. Use 10 to help you multiply.

a) $$\begin{aligned} 8 \times 13 &= 8 \times (10 + 3) \\ &= (8 \times 10) + (8 \times 3) \\ &= 80 + ? \\ &= ? \end{aligned}$$

b) $$\begin{aligned} 7 \times 16 &= 7 \times (10 + 6) \\ &= (7 \times ?) + (7 \times ?) \\ &= ? + ? \\ &= ? \end{aligned}$$

c) 4×12 d) 9×17 e) 5×18 f) 8×11 g) 6×15 h) 7×19

2. Find the products.

a) $$\begin{array}{rcrcr} 64 & = & 60 & + & 4 \\ \underline{9} & = & & & \underline{9} \\ & & 540 & + & 36 \end{array}$$

b) $\begin{array}{r} 98 \\ \underline{5} \end{array}$ c) $\begin{array}{r} 56 \\ \underline{8} \end{array}$ d) $\begin{array}{r} 85 \\ \underline{7} \end{array}$ e) $\begin{array}{r} 49 \\ \underline{6} \end{array}$ f) $\begin{array}{r} 77 \\ \underline{4} \end{array}$

3. Find the products.

a) $$\begin{array}{r} 59 \\ \underline{7} \\ 63 \\ \underline{350} \end{array}$$

b) $\begin{array}{r} 76 \\ \underline{5} \end{array}$ c) $\begin{array}{r} 48 \\ \underline{9} \end{array}$ d) $\begin{array}{r} 84 \\ \underline{6} \end{array}$ e) $\begin{array}{r} 67 \\ \underline{8} \end{array}$ f) $\begin{array}{r} 95 \\ \underline{4} \end{array}$

4. Multiply.

a) $$\begin{array}{r} 75 \\ \underline{4} \\ 300 \end{array}$$

Think	Record
20	0
28, 30	30

b) $\begin{array}{r} 68 \\ \underline{7} \end{array}$ c) $\begin{array}{r} 46 \\ \underline{8} \end{array}$ d) $\begin{array}{r} 94 \\ \underline{6} \end{array}$ e) $\begin{array}{r} 53 \\ \underline{9} \end{array}$ f) $\begin{array}{r} 87 \\ \underline{5} \end{array}$

5. Complete.

a) $$\begin{array}{r|l} 6\overline{)147} & \\ 60 & 10 \\ \hline 87 & \\ 60 & 10 \\ \hline 27 & \\ 24 & \underline{4} \\ \hline 3 & \end{array}$$

b) $3\overline{)54}$ c) $6\overline{)90}$ d) $4\overline{)68}$ e) $6\overline{)78}$ f) $5\overline{)95}$

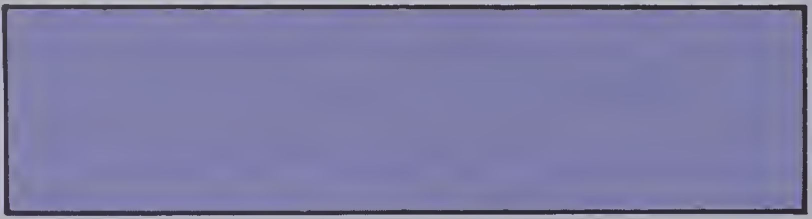
g) $4\overline{)48}$ h) $8\overline{)112}$ i) $9\overline{)189}$ j) $7\overline{)168}$ k) $8\overline{)200}$

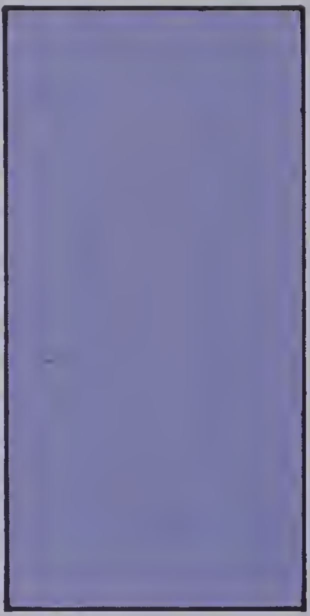
l) $9\overline{)257}$ m) $4\overline{)141}$ n) $7\overline{)325}$ o) $6\overline{)344}$ p) $8\overline{)236}$

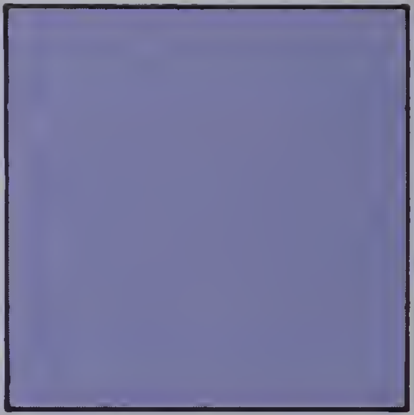
Unit 2, Check 4

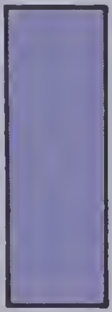
Do you understand perimeter, area, and volume?
Check your work with the answers at the bottom of the page.

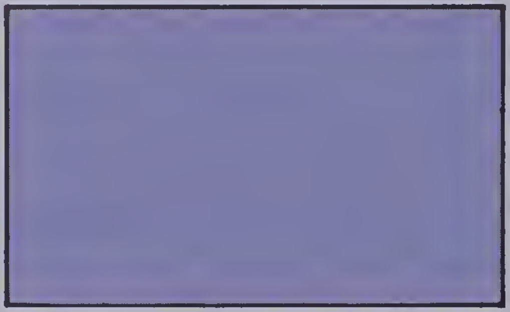
1. Find the perimeter of each rectangular shape.

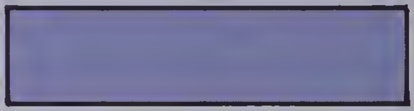
a)


b)


c)


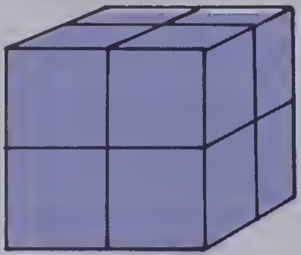
d)


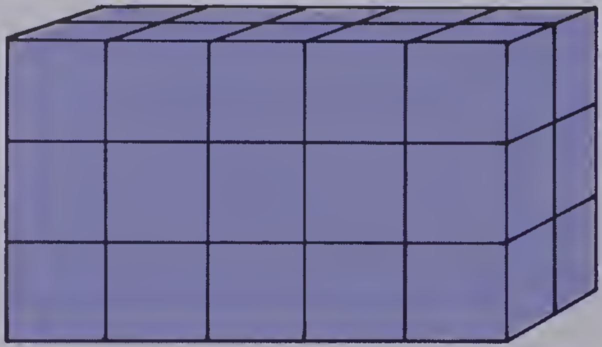
e)


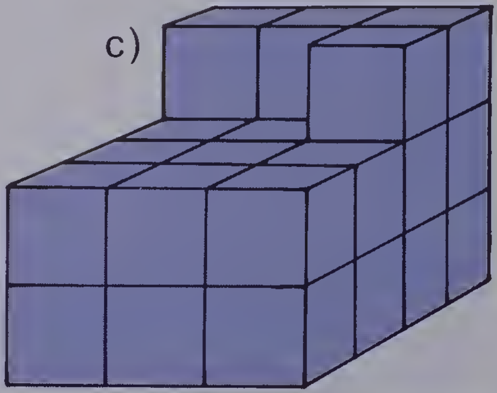
f)


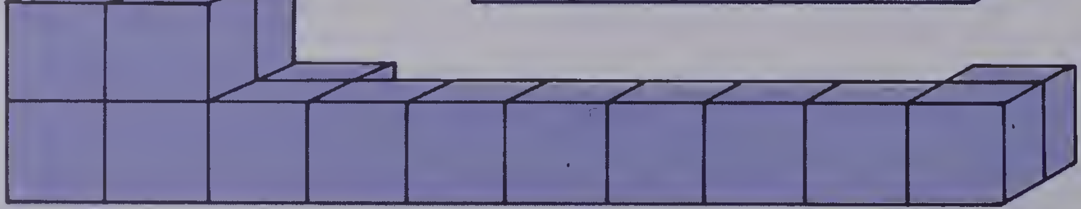
2. Find the area of each shape in Question 1.

3. What is the volume of each structure? Think about hidden cubes!

a)


b)


c)


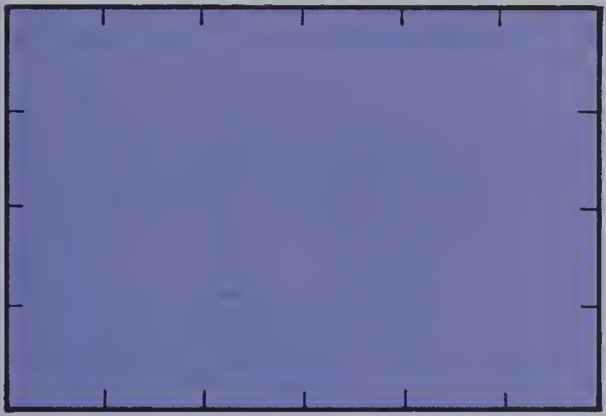
d)


1. a) 20 cm b) 18 cm c) 16 cm d) 8 cm e) 16 cm f) 10 cm
2. a) 16 cm ² b) 18 cm ² c) 16 cm ² d) 3 cm ² e) 15 cm ² f) 4 cm ²
3. a) 8 cm ³ b) 30 cm ³ c) 28 cm ³ d) 16 cm ³

Practice 4

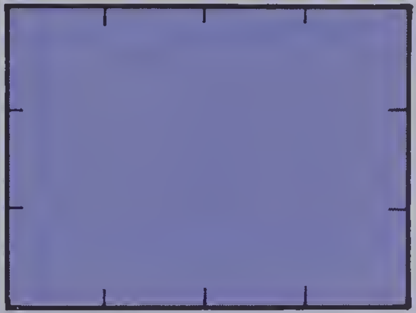
1. Find the area of each rectangular shape, in square centimetres.

a)

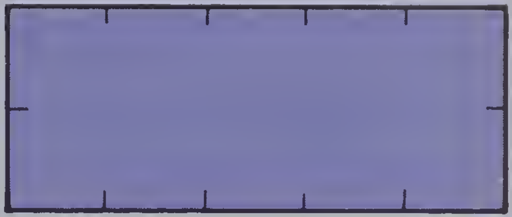


Area $= (6 \times 4)\ \text{cm}^2$
$= ?\ \text{cm}^2$

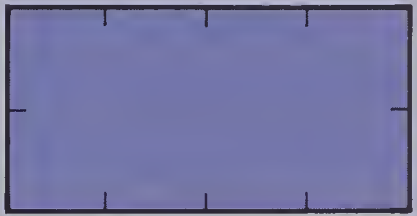
b)



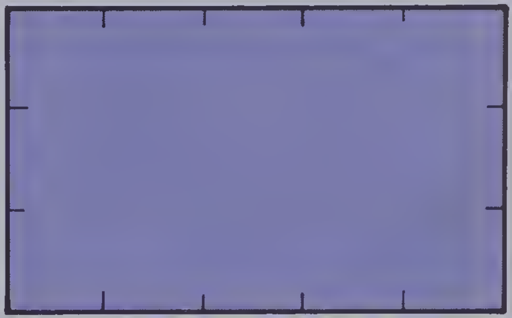
c)



d)



e)

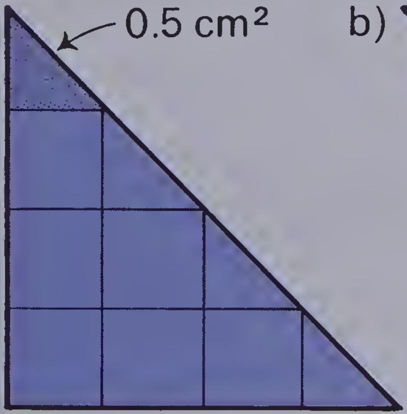


2. Find the perimeter of each shape in Question 1, in centimetres.

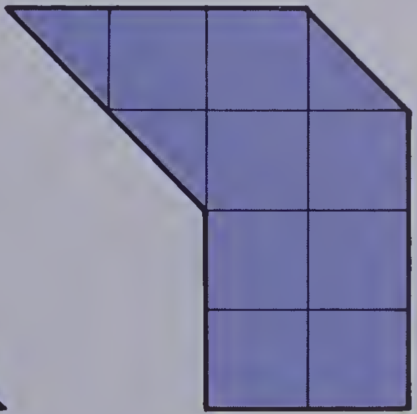
3. Suppose you built a structure 2 layers deep on each shape in Question 1. What would be the volume of each structure, in cubic centimetres?

4. Find the area of each shape.

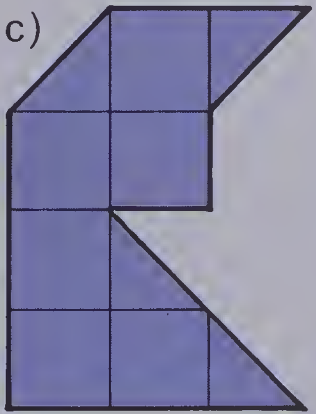
a)



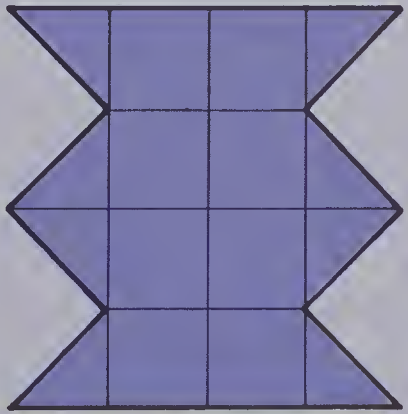
b)



c)

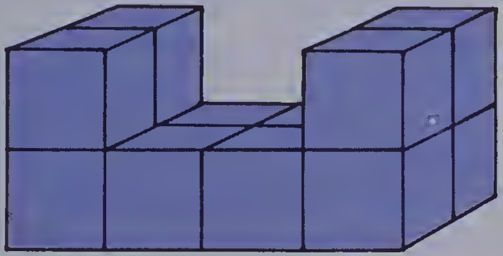


d)

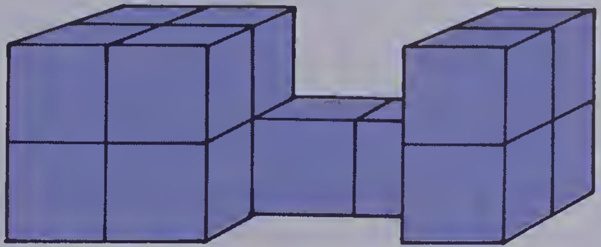


5. Find the volume of each structure. Each cube is $1\ \text{cm}^3$.

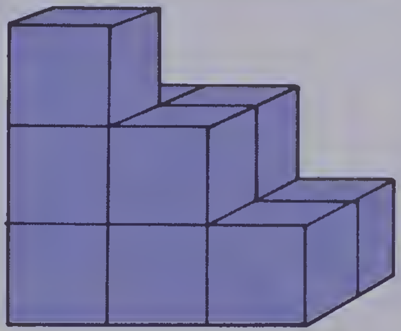
a)



b)



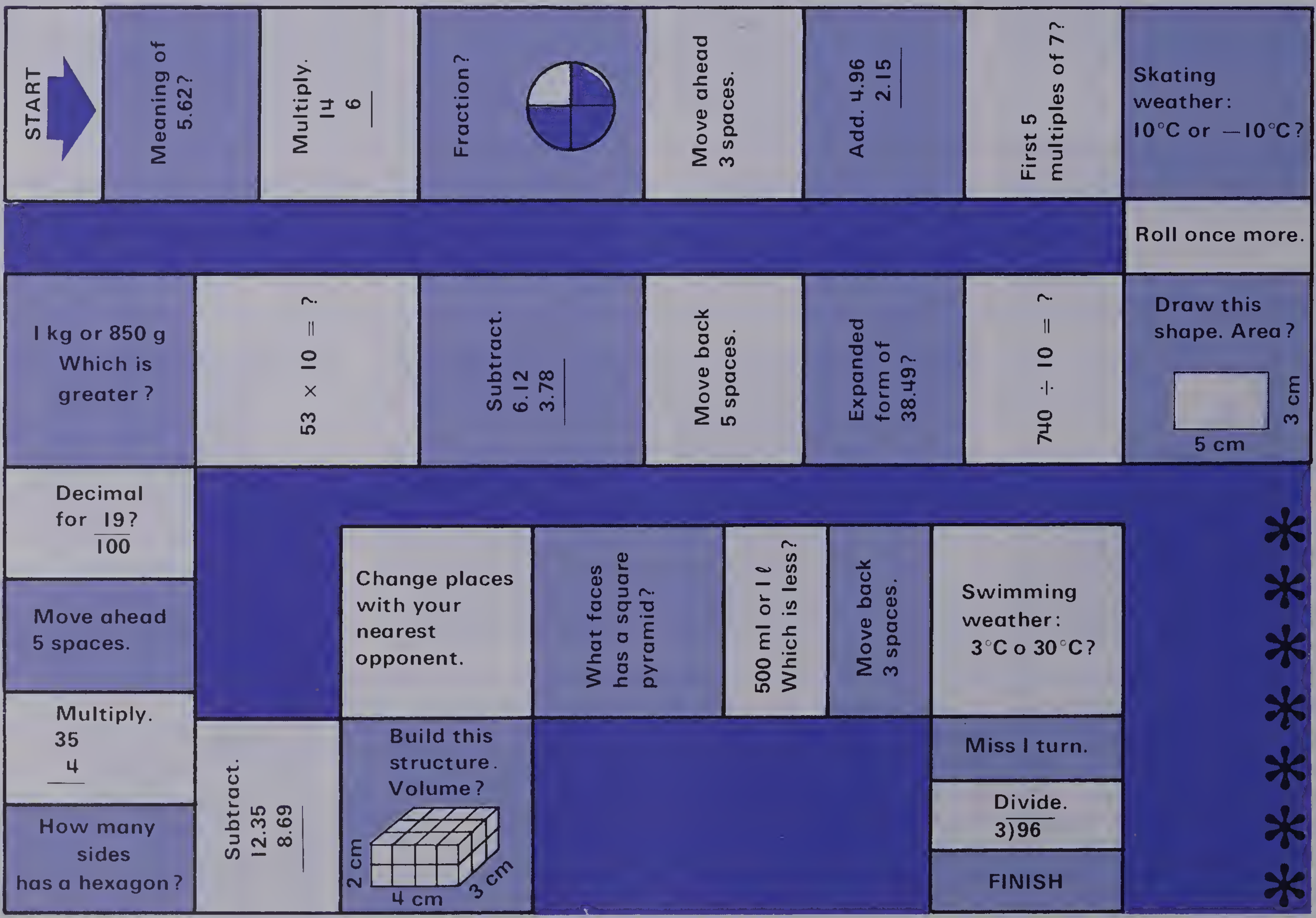
c)



21 (3 or 4 players)

You will need one ordinary die.
Each player will need a marker.
(A paper clip, 1 cm^3, or stone would do.)
To start, a player must roll an odd number.
In turn, move your marker
the number of spaces shown on the die.
To stay on that space,
you must answer the question correctly.

If your answer is incorrect,
move back 3 spaces.
If you land on a space
that already has a marker on it,
you may "bump" that marker
back 1 space.
To finish, a player must roll
the exact number
and land on "FINISH".



START

Meaning of 5.62?

Multiply.
$\begin{array}{r} 14 \\ \underline{6} \end{array}$

Fraction?

Move ahead 3 spaces.

Add. $\begin{array}{r} 4.96 \\ \underline{2.15} \end{array}$

First 5 multiples of 7?

Skating weather: 10°C or −10°C?

Roll once more.

Draw this shape. Area?

740 ÷ 10 = ?

Expanded form of 38.49?

Move back 5 spaces.

Subtract. $\begin{array}{r} 6.12 \\ \underline{3.78} \end{array}$

53 × 10 = ?

1 kg or 850 g Which is greater?

Decimal for $\frac{19}{100}$?

Move ahead 5 spaces.

Multiply.
$\begin{array}{r} 35 \\ \underline{4} \end{array}$

How many sides has a hexagon?

Subtract. $\begin{array}{r} 12.35 \\ \underline{8.69} \end{array}$

Build this structure. Volume?

Change places with your nearest opponent.

What faces has a square pyramid?

500 ml or 1 ℓ Which is less?

Move back 3 spaces.

Swimming weather: 3°C o 30°C?

Miss 1 turn.

Divide.
$3\overline{)96}$

FINISH

3

Thousands to Hundredths

4 THOUSANDS, 3 HUNDREDS, 7 TENS, 6 ONES, 1 TENTH, and 2 HUNDREDTHS

meaning

↑

4376.12

(read as "four thousand, three hundred and seventy-six decimal one two")

expanded form

4000 + 300 + 70 + 6 + 0.1 + 0.02

place value chart

THOUSANDS	HUNDREDS	TENS	ONES	TENTHS	HUNDREDTHS
4	3	7	6	1	2

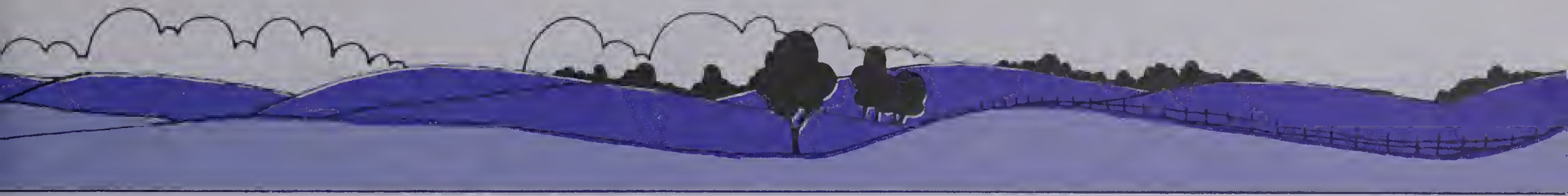
Use the same ways to explain 7192.86.

IN ACTION

What numbers are represented?

1. a) 2 thousands, 3 hundreds, 1 ten, 9 ones, 0 tenths, and 4 hundredths
   b) 5 thousands, 1 hundred, 3 tens, 0 ones, 2 tenths, and 7 hundredths
   c) 8 thousands, 4 hundreds, 5 tens, 1 one, 7 tenths, and 2 hundredths
   d) 9 thousands, 2 hundreds, 7 tens, 2 ones, 3 tenths, and 1 hundredth
   e) 6 thousands, 7 hundreds, 9 tens, 8 ones, 1 tenth, and 0 hundredths
   f) 3 thousands, 5 hundreds, 0 tens, 7 ones, 4 tenths, and 6 hundredths
   g) 1 thousand, 8 hundreds, 2 tens, 4 ones, 6 tenths, and 9 hundredths
   h) 4 thousands, 6 hundreds, 4 tens, 3 ones, 5 tenths, and 8 hundredths
   i) 7 thousands, 9 hundreds, 6 tens, 5 ones, 8 tenths, and 3 hundredths
   j) 2 thousands, 0 hundreds, 8 tens, 6 ones, 9 tenths, and 1 hundredth

2. a) 8000 + 100 + 50 + 5 + 0.2 + 0.03   b) 6000 + 200 + 90 + 7 + 0.4 + 0.00
   c) 1000 + 500 + 10 + 4 + 0.6 + 0.02   d) 7000 + 600 + 80 + 8 + 0.9 + 0.05
   e) 5000 + 900 + 30 + 3 + 0.0 + 0.04   f) 9000 + 800 + 70 + 9 + 0.5 + 0.06
   g) 3000 + 700 + 40 + 2 + 0.1 + 0.08   h) 4000 + 400 + 60 + 0 + 0.5 + 0.07



3. a)

THOUSANDS	HUNDREDS	TENS	ONES	TENTHS	HUNDREDTHS
6	4	8	7	5	1

b)

THOUSANDS	HUNDREDS	TENS	ONES	TENTHS	HUNDREDTHS
9	5	1	0	7	3

c)

THOUSANDS	HUNDREDS	TENS	ONES	TENTHS	HUNDREDTHS
1	8	7	9	0	2

d)

THOUSANDS	HUNDREDS	TENS	ONES	TENTHS	HUNDREDTHS
4	9	3	6	1	5

e)

1000	100	10	1	0.1	0.01
2	6	6	3	9	7

f)

1000	100	10	1	0.1	0.01
7	7	4	2	8	6

g)

1000	100	10	1	0.1	0.01
3	2	5	5	6	8

h)

1000	100	10	1	0.1	0.01
3	0	1	8	2	9

Use the method suggested to explain the numbers.

4. The Meaning

a) 5901.38 b) 7130.96 c) 8822.75 d) 2259.17 e) 6743.02

f) 4378.51 g) 9664.43 h) 1487.80 i) 4091.32 j) 7203.15

5. Expanded Form

a) 2715.48 b) 1327.29 c) 1089.67 d) 6470.53 e) 9642.81

f) 8534.64 g) 3856.97 h) 1968.02 i) 3255.18 j) 4079.26

6. Place Value Chart

a) 2641.51 b) 5988.67 c) 4033.95 d) 6597.89 e) 7506.44

f) 4215.35 g) 3042.18 h) 1578.46 i) 3701.59 j) 2097.81

7. What is the value of each coloured digit?

a) 8310.95 b) 6903.17 c) 5722.88 d) 7195.22 e) 2034.76

f) 1587.34 g) 3446.69 h) 8078.41 i) 5523.14 j) 8221.40

k) 6854.71 l) 9175.03 m) 1708.92 n) 4319.65 o) 2696.37

8. The following numerals use the digits 0, 1, 2, 3, 4, and 5.
Put them in order from greatest to least.

3120.45

2103.45

4123.05

1023.45

5012.34

3012.45

1230.45

3124.50

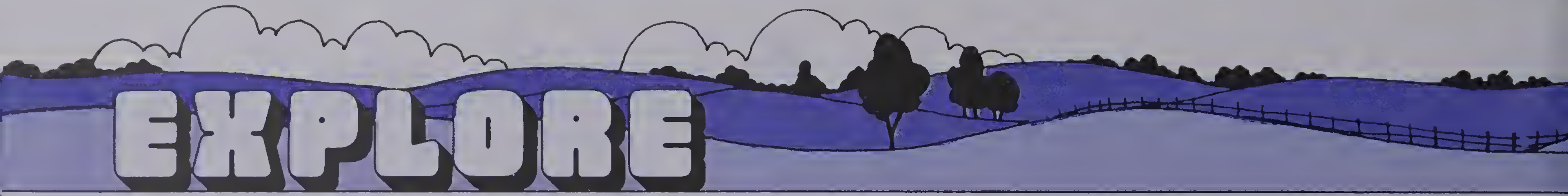
5120.34

5123.40

2134.05

4102.35

1234.50



Addition / 4-Digit Numbers / Regrouping

ADD.

5 763
5 578

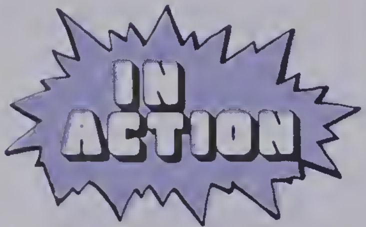
A

5 763
5 578
11 (8 + 3)
130 (70 + 60)
1 200 (500 + 700)
10 000 (5000 + 5000)
11 341

B

5 763
5 578
11 341

Think	Record
11	1
8, 14	4
6, 13	3
6, 11	11



1. Add this way.

5 995
5 276
11
160
1 100
10 000
11 271

a)	b)	c)	d)	e)
9 789 3 691	8 867 8 247	4 878 7 744	9 691 2 929	9 765 9 567

f)	g)	h)	i)	j)
6 818 7 596	8 394 3 769	9 935 7 886	7 795 8 345	6 549 8 863

k)	l)	m)	n)	o)
3 748 9 987	5 858 5 892	9 478 3 767	8 586 8 925	4 788 7 679

2. Add.

a)	b)	c)	d)	e)	f)
5 866 9 294	7 887 6 794	8 669 2 545	8 879 7 941	6 697 5 457	8 798 9 414

g)	h)	i)	j)	k)	l)
6 979 4 572	7 989 4 149	9 796 5 727	9 898 1 493	7 966 7 279	8 987 4 935

m)	n)	o)	p)	q)	r)
9 668 2 795	9 873 9 357	6 689 7 952	8 736 3 576	6 891 9 529	7 369 5 766

Subtraction / 4-Digit Numbers / Regrouping

SUBTRACT.

$$\begin{array}{r}9326\\2987\\\hline\end{array}$$

$$\begin{array}{r}9326\\2987\\\hline 6339\end{array}\downarrow$$

Think	Record
16, 9	9
11, 3	3
12, 3	3
8, 6	6

IN ACTION

1. Subtract. Exchange 1 for 10.

$$\begin{array}{llllll}
a)\ \begin{array}{r}9114\\1796\\\hline\end{array} & b)\ \begin{array}{r}7242\\3993\\\hline\end{array} & c)\ \begin{array}{r}8620\\2865\\\hline\end{array} & d)\ \begin{array}{r}6071\\4994\\\hline\end{array} & e)\ \begin{array}{r}5004\\2177\\\hline\end{array} & f)\ \begin{array}{r}3542\\1697\\\hline\end{array}\\
g)\ \begin{array}{r}4031\\2272\\\hline\end{array} & h)\ \begin{array}{r}6082\\3895\\\hline\end{array} & i)\ \begin{array}{r}8334\\4568\\\hline\end{array} & j)\ \begin{array}{r}9536\\5847\\\hline\end{array} & k)\ \begin{array}{r}7111\\4863\\\hline\end{array} & l)\ \begin{array}{r}5532\\1697\\\hline\end{array}\\
m)\ \begin{array}{r}4603\\1948\\\hline\end{array} & n)\ \begin{array}{r}9275\\3487\\\hline\end{array} & o)\ \begin{array}{r}5010\\3356\\\hline\end{array} & p)\ \begin{array}{r}8126\\5798\\\hline\end{array} & q)\ \begin{array}{r}7045\\2979\\\hline\end{array} & r)\ \begin{array}{r}6083\\1295\\\hline\end{array}
\end{array}$$

2. How long ago?

a) first Canadian steamship,
Accommodation, 1809

b) first canal,
Coteau-du-Lac, 1780

c) first railway line, Albion
coal mines to New Glasgow, 1839

d) first railway bridge,
Fort Erie, 1873

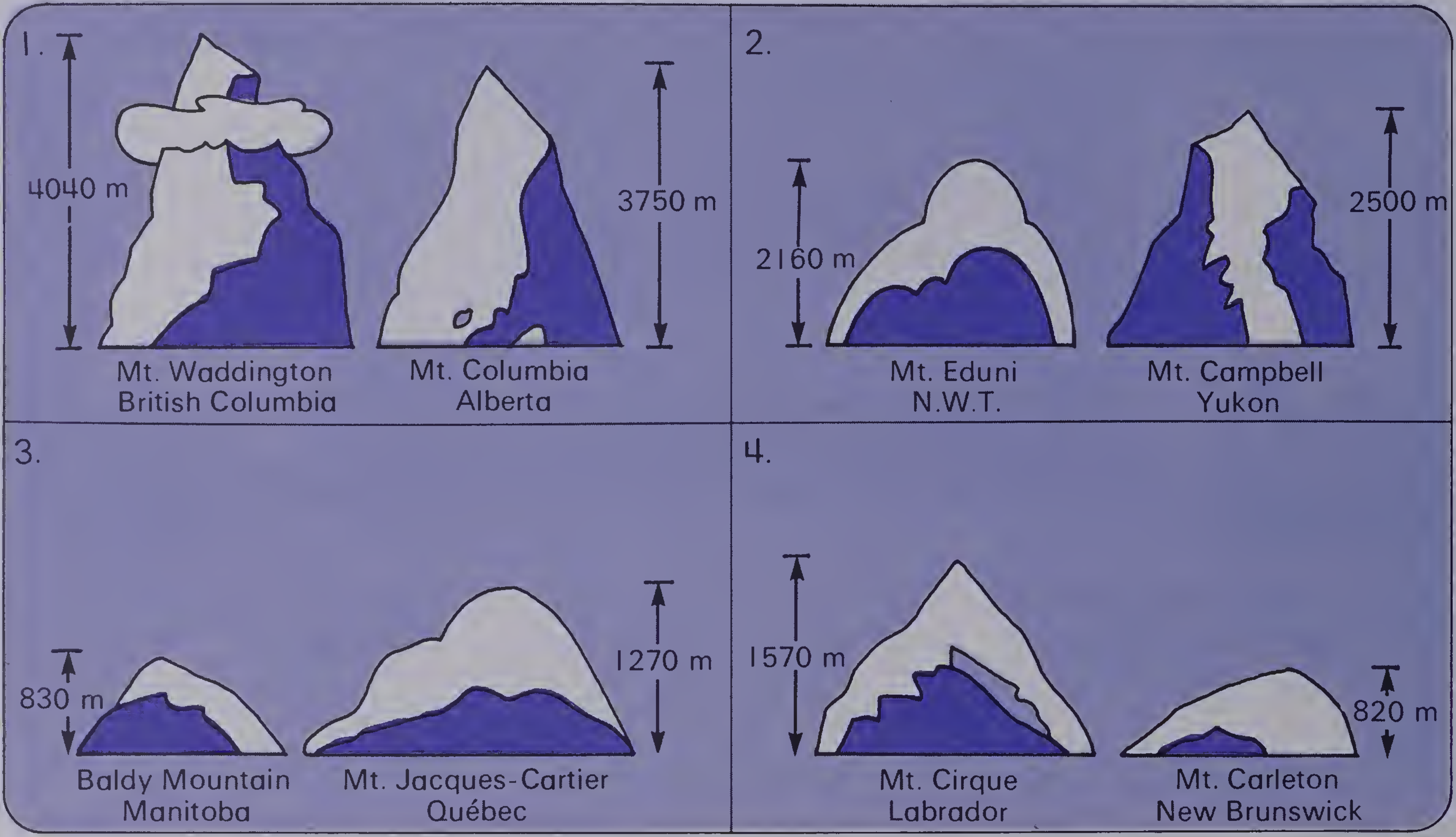
e) first postal service,
Montréal to Québec, 1721

f) first streetcar line,
Toronto, 1861

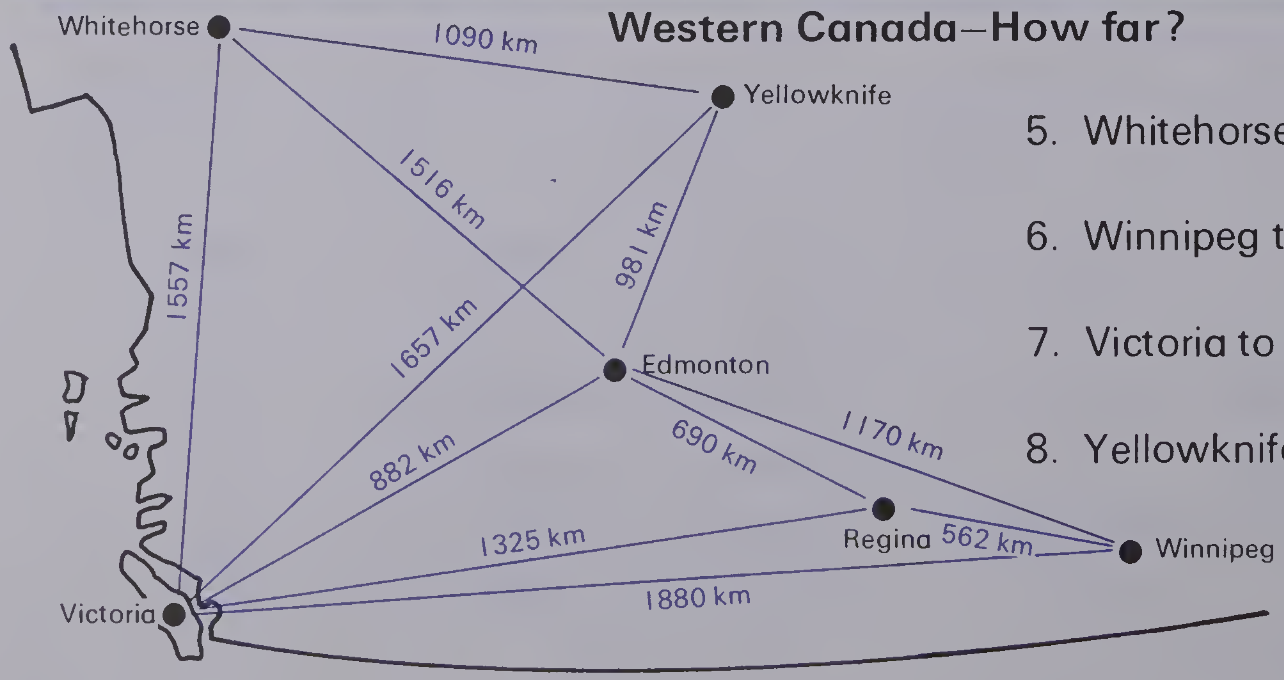
EXPLORE

Picture Problems

Mountains of Canada—How much higher?


1.
4040 m
3750 m
Mt. Waddington
British Columbia
Mt. Columbia
Alberta
2.
2160 m
2500 m
Mt. Eduni
N.W.T.
Mt. Campbell
Yukon
3.
830 m
1270 m
Baldy Mountain
Manitoba
Mt. Jacques-Cartier
Québec
4.
1570 m
820 m
Mt. Cirque
Labrador
Mt. Carleton
New Brunswick

Western Canada—How far?


Whitehorse
Yellowknife
Edmonton
Regina
Winnipeg
Victoria
1090 km
1516 km
981 km
1557 km
1657 km
882 km
690 km
1170 km
1325 km
562 km
1880 km

5. Whitehorse to Edmonton to Regina

6. Winnipeg to Regina to Victoria

7. Victoria to Whitehorse to Yellowknife

8. Yellowknife to Victoria to Winnipeg

Addition / Regrouping

ADD.
969.82
887.68

A

969.82	
887.68	
0.10	(0.08 + 0.02)
1.40	(0.6 + 0.8)
16.00	(7 + 9)
140.00	(80 + 60)
1700.00	(800 + 900)
1857.50	

B

969.82
887.68
1857.50

Think	Record
10	0
7, 15	5
8, 17	7
9, 15	5
9, 18	18

IN ACTION

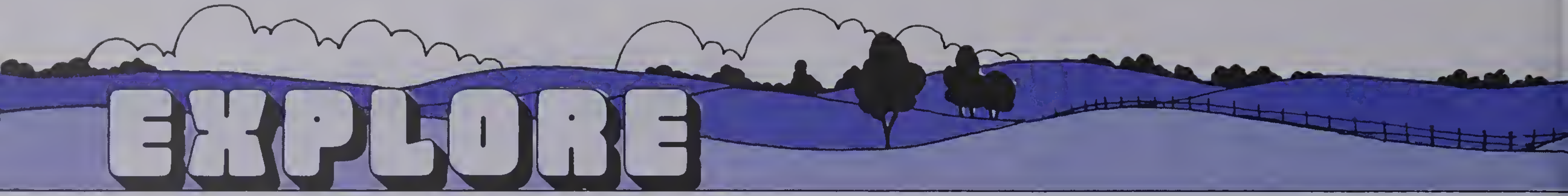
737.45
498.97
0.12
1.30
15.00
120.00
1100.00
1236.42

1. Add this way. Exchange 10 for 1.

a) 891.28 528.96	b) 369.54 766.79	c) 912.89 298.67	d) $695.47 667.98
e) 128.96 986.78	f) $954.73 679.89	g) 289.69 867.88	h) 547.37 789.93
i) 896.95 678.88	j) 473.77 989.39	k) $544.93 686.48	l) 757.93 983.89

2. Add.

a) $679.48 887.96	b) 529.16 786.96	c) 387.68 755.93	d) $699.87 792.47	e) 997.68 154.49
f) 688.75 572.69	g) $489.55 783.58	h) 596.98 888.76	i) 737.79 893.94	j) $899.68 429.73



EXPLORE

Subtraction / Regrouping

SUBTRACT.

$$\begin{array}{r} 736.31 \\ \underline{489.93} \end{array}$$

$$\begin{array}{r} 736.31 \\ \underline{489.93} \\ 246.38 \end{array} \downarrow$$

Think	Record
11, 8	8
12, 3	3
15, 6	6
12, 4	4
6, 2	2

IN ACTION

1. Subtract. Exchange 1 for 10.

a) 810.05 356.37	b) 672.30 584.84	c) $962.35 497.96	d) 711.16 436.87	e) 435.43 248.86
f) $632.80 155.98	g) 813.02 327.28	h) 545.40 259.77	i) $901.70 614.99	j) 702.62 156.83
k) 842.41 299.69	l) $310.73 153.88	m) 905.20 567.44	n) 502.51 447.66	o) $760.53 281.79

2. How much taller?

a) Douglas Fir, 60.54 m
or White Pine, 58.79 m

b) Rock Elm, 27.87 m
or Sugar Maple, 40.43 m

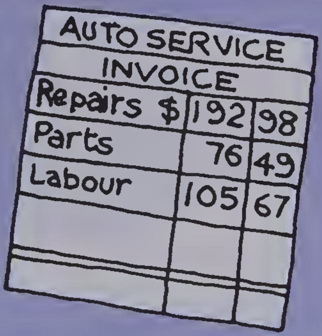
c) White Birch, 20.95 m
or White Oak, 45.81 m

d) Flowering Dogwood, 11.98 m
or Ginkgo, 23.13 m

Picture Problems

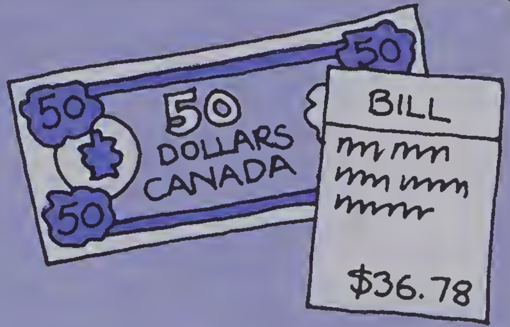
1\.

TOTAL BILL?


AUTO SERVICE
INVOICE
Repairs $ 192 98
Parts 76 49
Labour 105 67

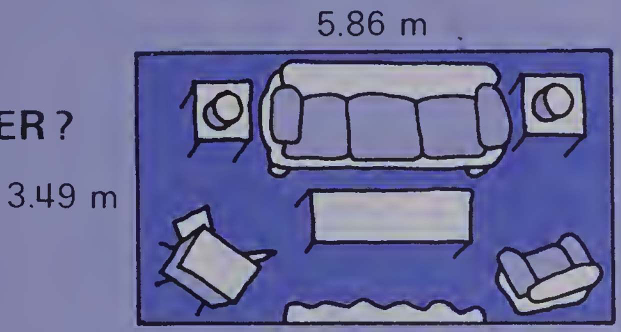
2\.

CHANGE?


50
50 DOLLARS CANADA
50
50
BILL
$36.78

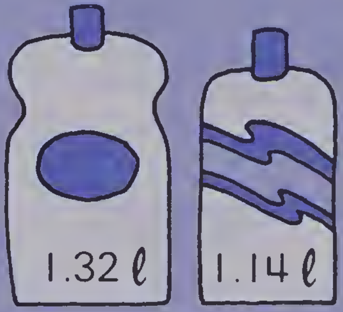
3\.

PERIMETER?



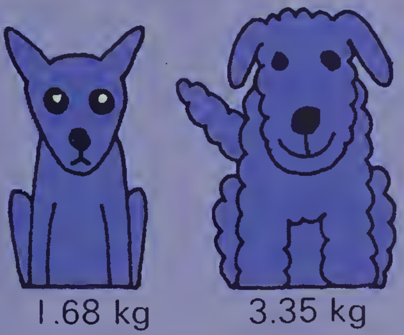
4\.

HOW MUCH LARGER?



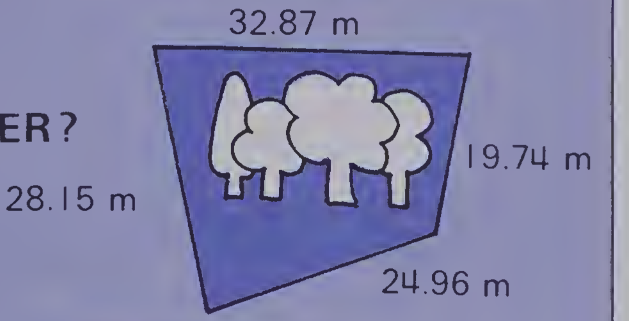
5\.

TOTAL MASS?


1.68 kg
3.35 kg

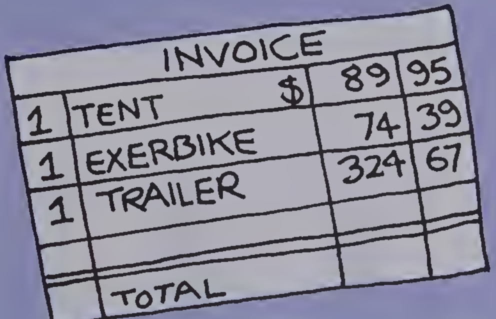
6\.

PERIMETER?


32.87 m
28.15 m
19.74 m
24.96 m

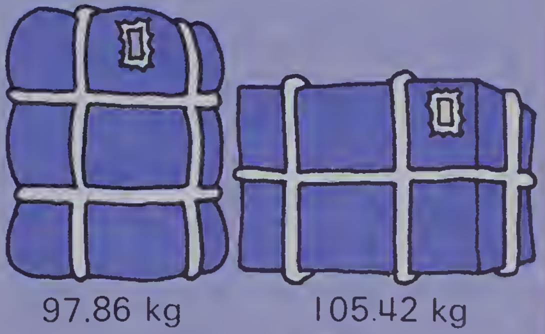
7\.

TOTAL BILL?


INVOICE
1 TENT $ 89 95
1 EXERBIKE 74 39
1 TRAILER 324 67
TOTAL

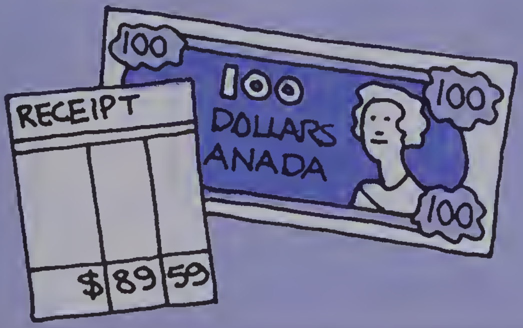
8\.

HOW MUCH HEAVIER?


97.86 kg
105.42 kg

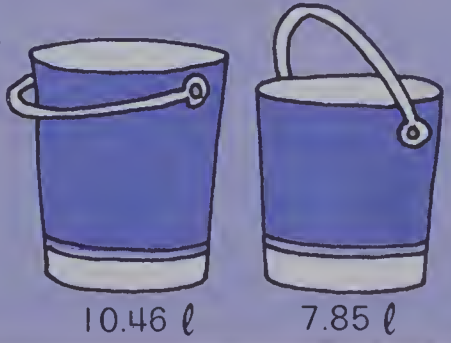
9\.

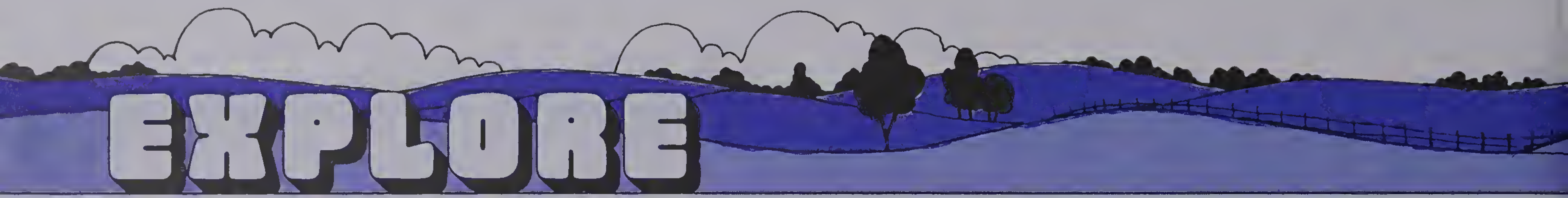
CHANGE?


RECEIPT
$ 89 59
100
100 DOLLARS ANADA
100
100

10\.

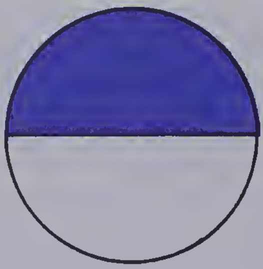
TOTAL CAPACITY?

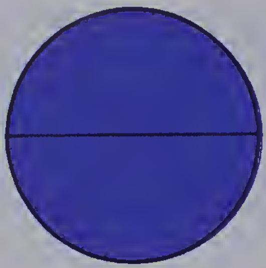




EXPLORE

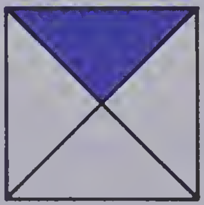
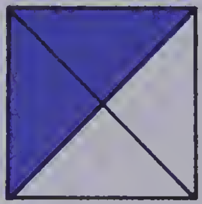
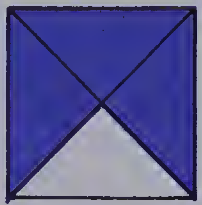
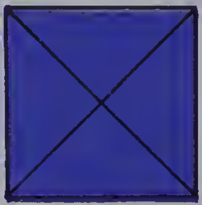
Fractions Equivalent to Whole Numbers

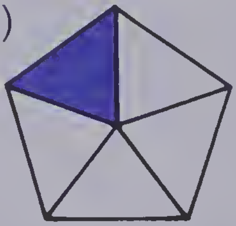
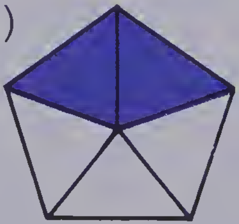
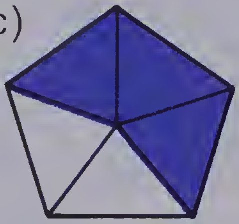
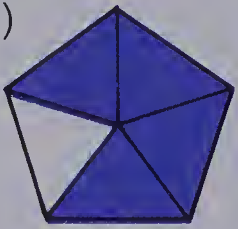
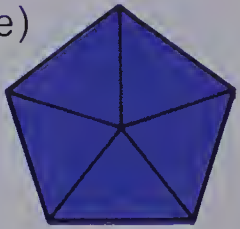
a)  $\frac{1}{2}$

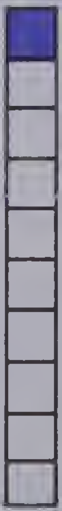
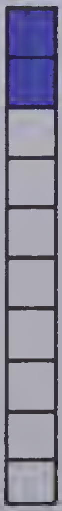
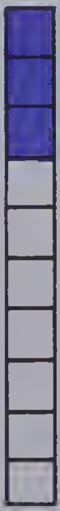
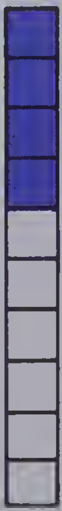
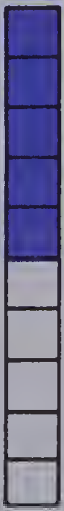
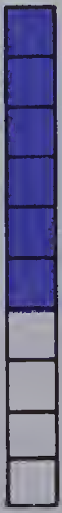
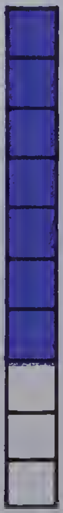
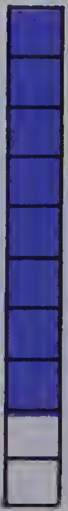
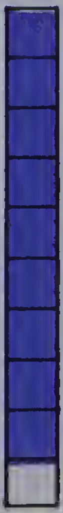
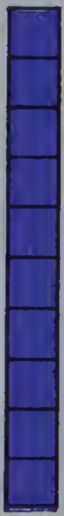
b)  $\frac{2}{2}$

IN ACTION

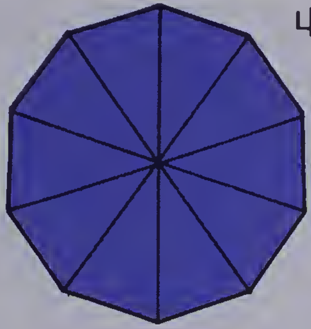
What fraction of each shape is shaded?
Write your answers.

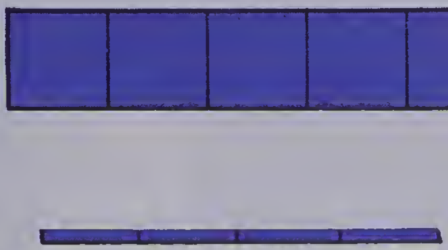
1. a) 
b) 
c) 
d) 

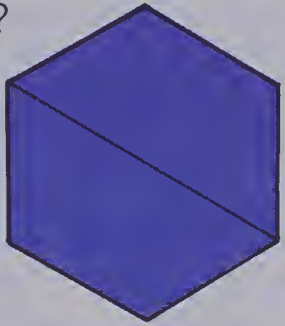
2. a) 
b) 
c) 
d) 
e) 

3. a) 
b) 
c) 
d) 
e) 
f) 
g) 
h) 
i) 
j) 

4. a) What fraction of each shape is shaded?



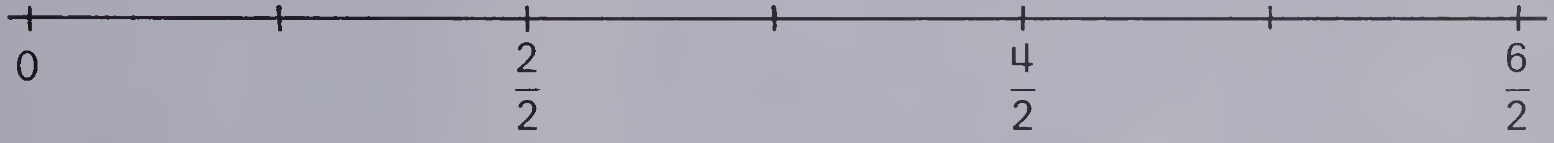




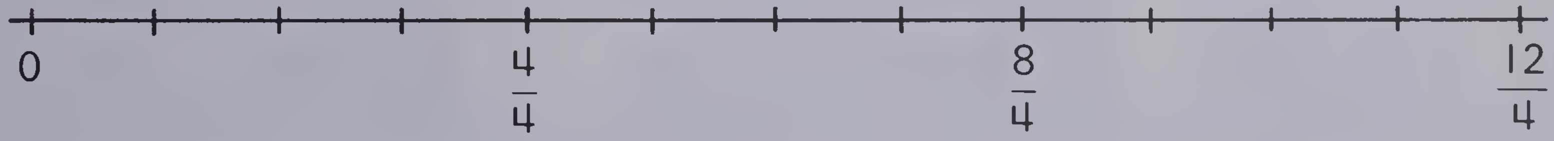
b) What **whole number** could you write for each of these fractions?

5. What whole numbers could you write for each fraction?

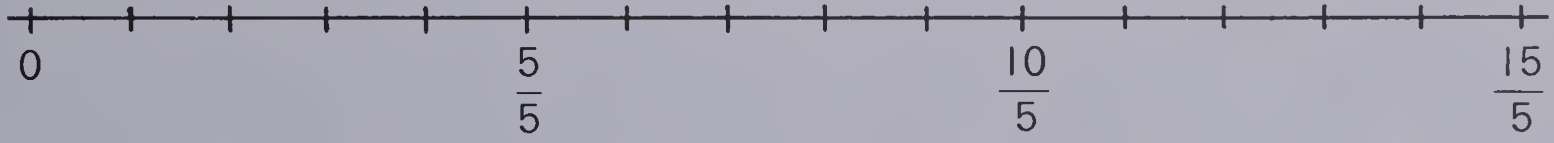
a)


0
$\frac{2}{2}$
$\frac{4}{2}$
$\frac{6}{2}$

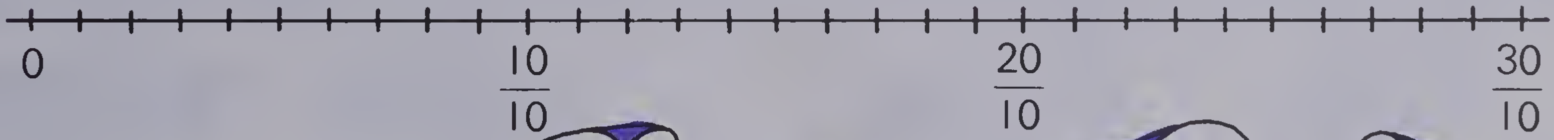
b)


0
$\frac{4}{4}$
$\frac{8}{4}$
$\frac{12}{4}$

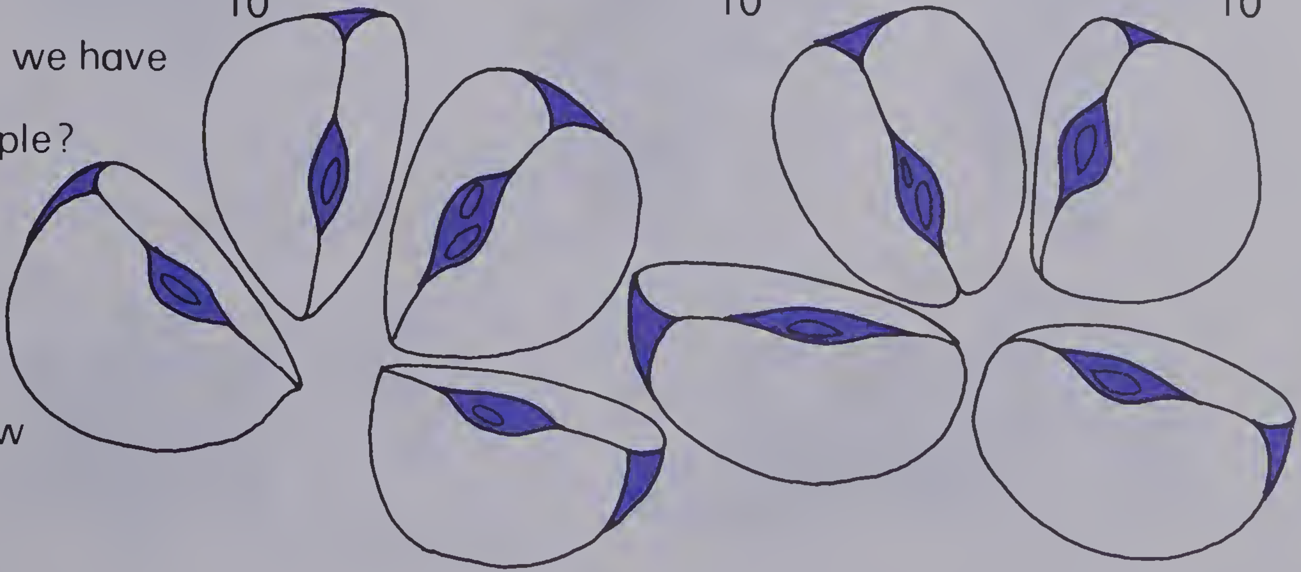
c)


0
$\frac{5}{5}$
$\frac{10}{5}$
$\frac{15}{5}$

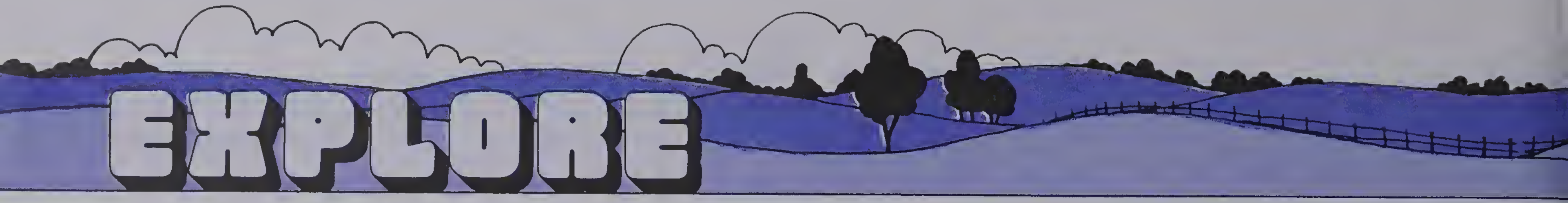
d)


0
$\frac{10}{10}$
$\frac{20}{10}$
$\frac{30}{10}$

6. How many apples do we have if we have $\frac{8}{4}$ of an apple?



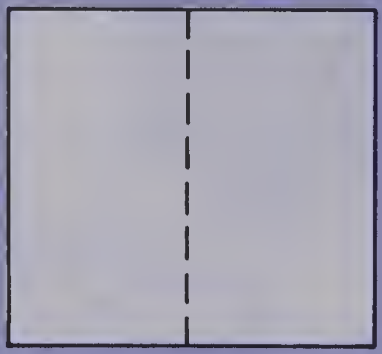
7. Draw pictures to show $\frac{6}{2}$ and $\frac{10}{5}$.



EXPLORE

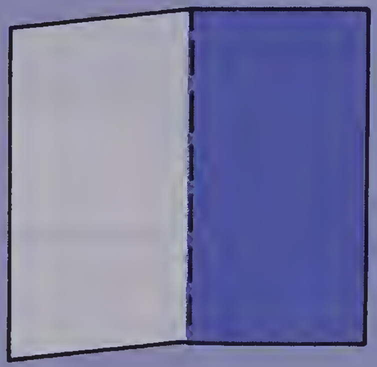
Equivalent Fractions

A



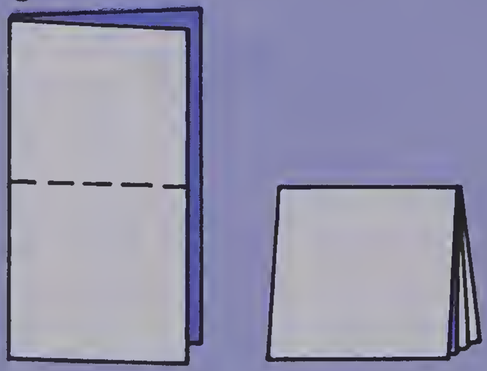
Fold
a piece of paper
in half.

B



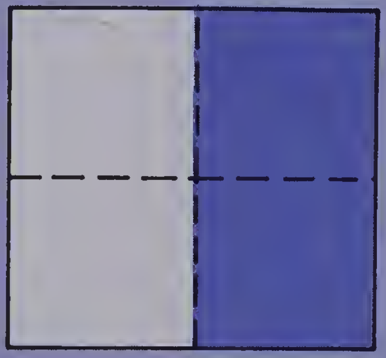
Colour $\frac{1}{2}$.

C



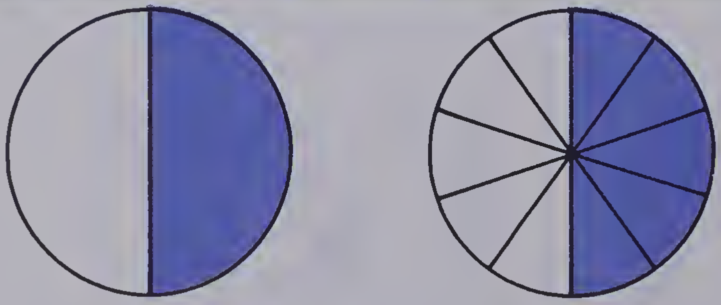
Fold the paper
again.

D

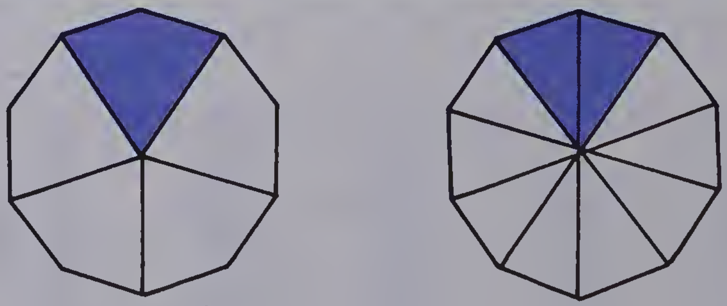


Name 2 fractions
to show what
part is coloured.

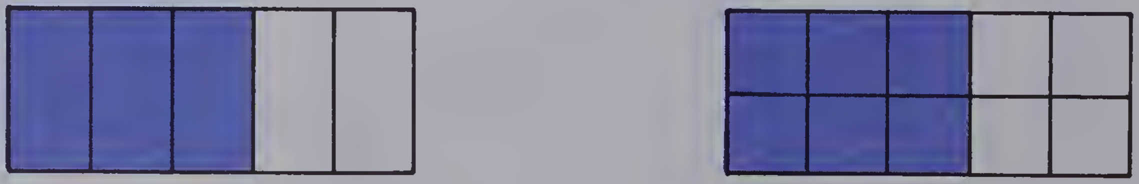
$\frac{1}{2} = \frac{2}{4}$ $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent fractions.



$\frac{1}{2}$ is equivalent to $\frac{5}{10}$



$\frac{1}{5}$ is equivalent to ?

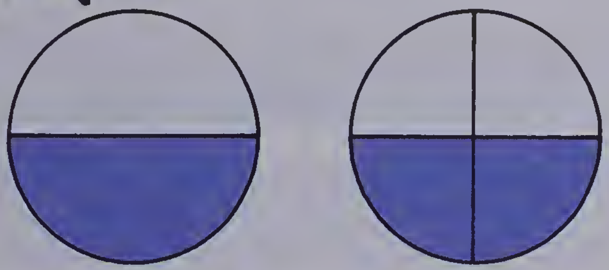


? is equivalent to ?

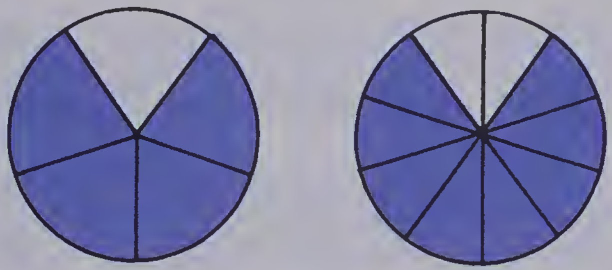
IN ACTION

1. Write the equivalent fractions.

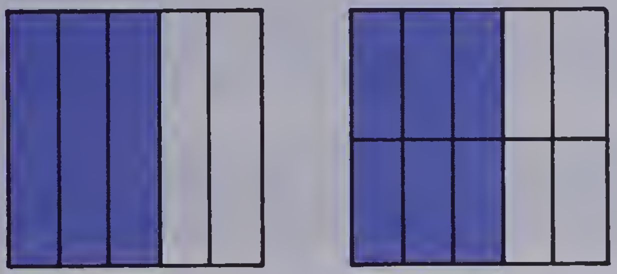
a)



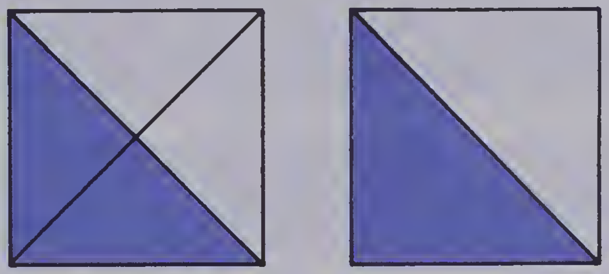
b)



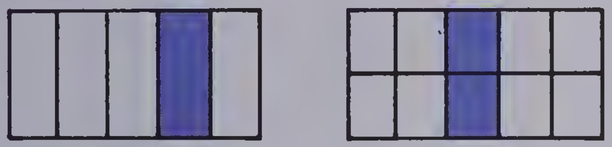
c)



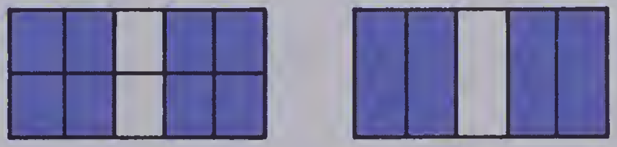
d)



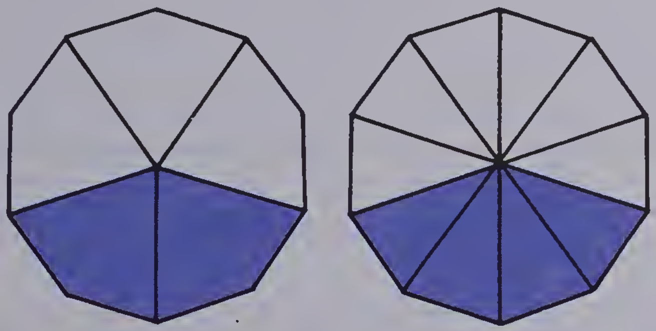
e)



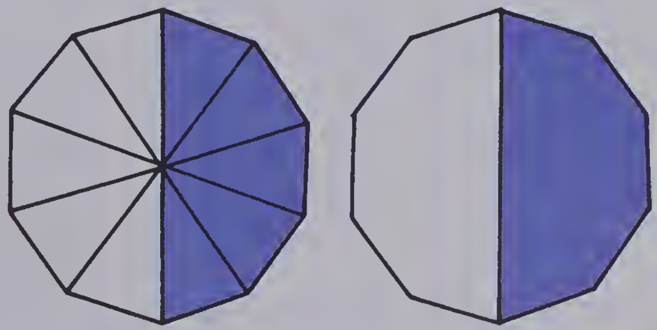
f)



g)

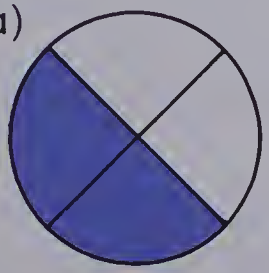


h)

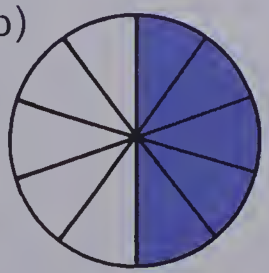


2. Write 2 fractions
to show what part is shaded.

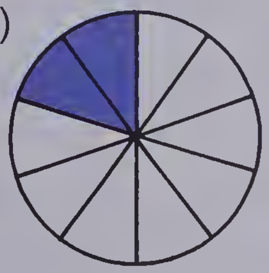
a)



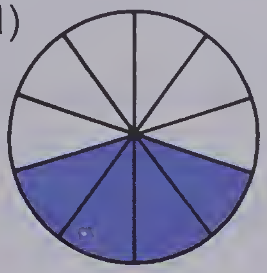
b)



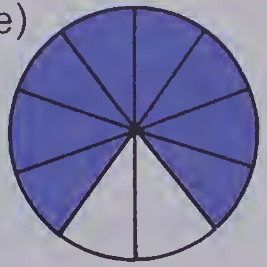
c)



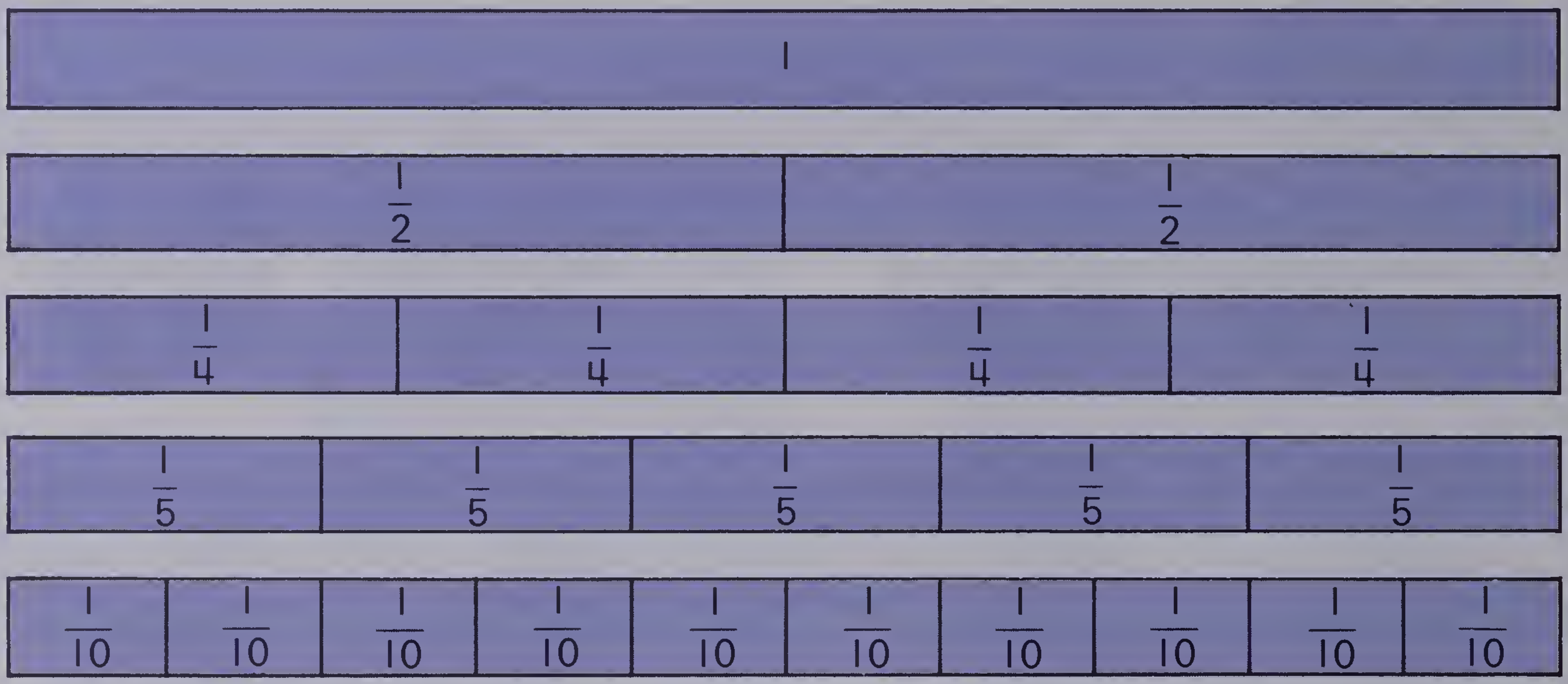
d)



e)



3.


1
1/2
1/2
1/4
1/4
1/4
1/4
1/5
1/5
1/5
1/5
1/5
1/10
1/10
1/10
1/10
1/10
1/10
1/10
1/10
1/10
1/10

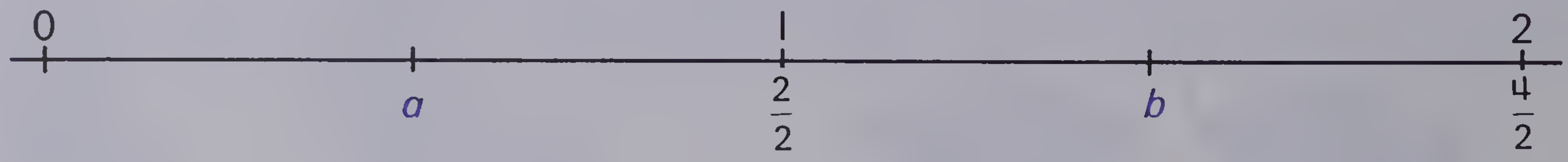
Use the diagram to help you find the answers.

a) $\frac{1}{2} = \frac{?}{4}$ b) $\frac{1}{2} = \frac{?}{10}$ c) $\frac{2}{5} = \frac{?}{10}$ d) $\frac{?}{5} = \frac{8}{10}$ e) $\frac{6}{10} = \frac{?}{5}$

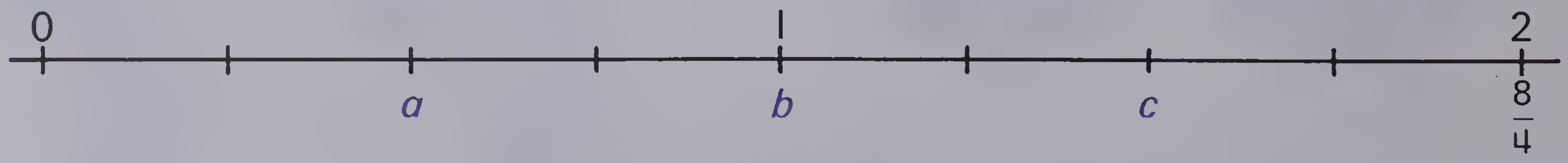
f) $\frac{4}{4} = \frac{10}{?}$ g) $\frac{2}{?} = \frac{4}{4}$ h) $1 = \frac{?}{5}$ i) $? = \frac{10}{10}$ j) $\frac{4}{?} = 1$

What are the fractions?

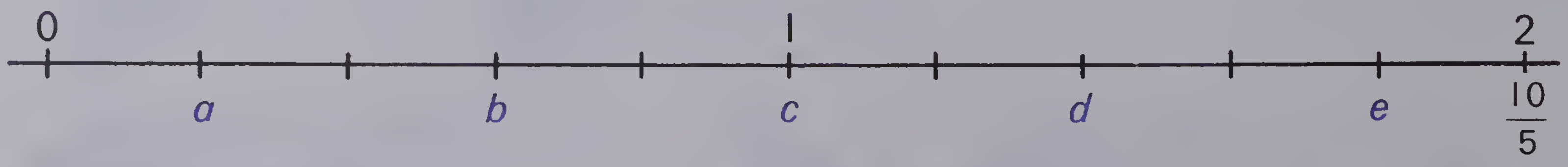
4.



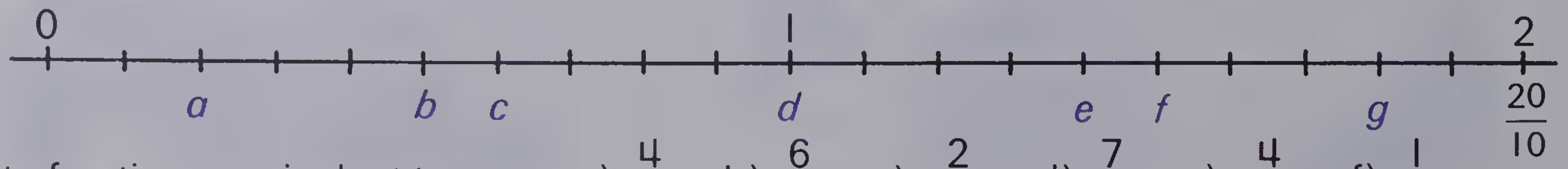
5.



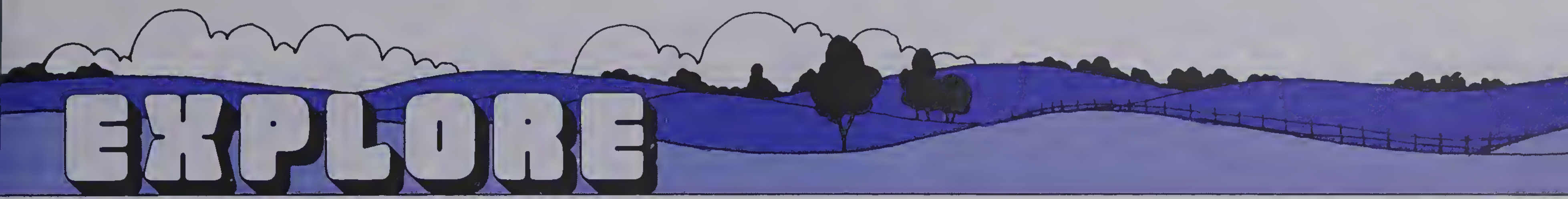
6.


0
1
2
a
b
c
d
e
10/5

7.

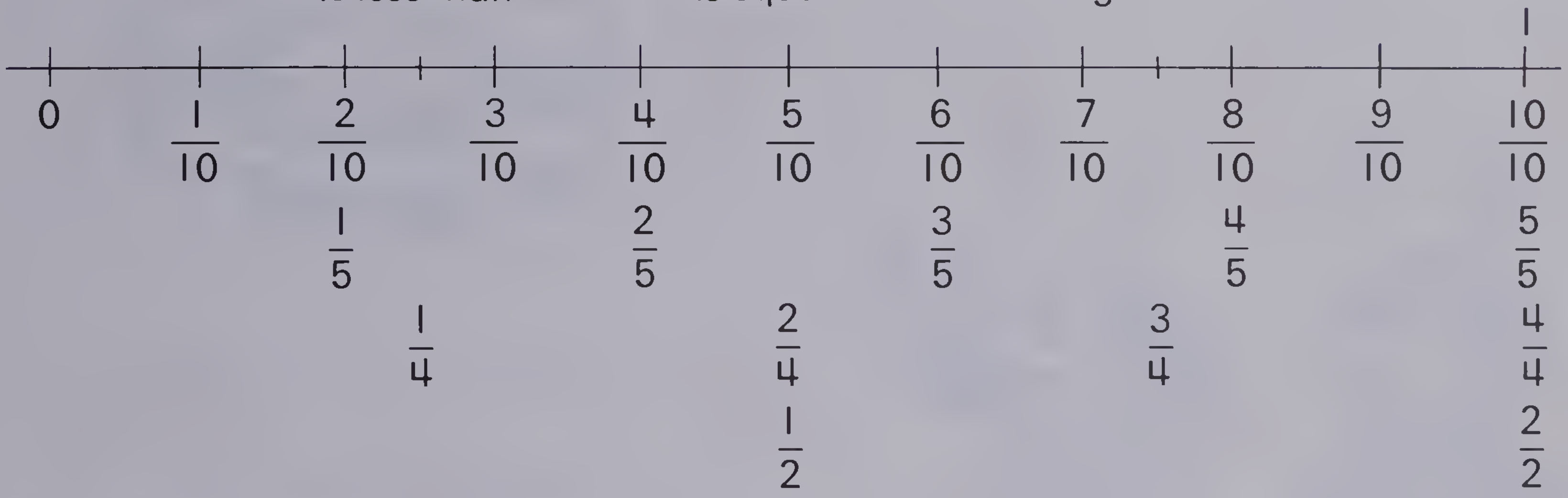

0
1
2
a
b
c
d
e
f
g
20/10

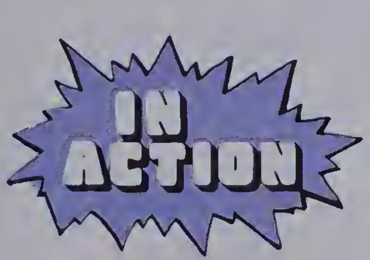
8. Write fractions equivalent to : a) $\frac{4}{5}$ b) $\frac{6}{4}$ c) $\frac{2}{10}$ d) $\frac{7}{5}$ e) $\frac{4}{10}$ f) $\frac{1}{2}$



Greater Than, Less Than

$<$ is less than $=$ is equal to $>$ is greater than


0
1/10
2/10
1/5
1/4
3/10
4/10
2/5
5/10
2/4
1/2
6/10
3/5
7/10
3/4
8/10
4/5
9/10
10/10
5/5
4/4
2/2
1



$$\frac{3}{10} > \frac{1}{5} \quad \frac{5}{10} = \frac{?}{2} \quad \frac{?}{4} < \frac{7}{10}$$

1. Write a sentence using $<$ or $=$ or $>$.

   a) $\frac{5}{10}, \frac{3}{10}$ b) $\frac{4}{10}, \frac{9}{10}$ c) $\frac{2}{5}, \frac{2}{10}$ d) $\frac{5}{5}, \frac{3}{5}$ e) $\frac{1}{4}, \frac{3}{4}$ f) $\frac{4}{4}, \frac{3}{4}$

   g) $\frac{3}{10}, \frac{1}{5}$ h) $\frac{4}{5}, \frac{6}{10}$ i) $\frac{4}{10}, \frac{2}{5}$ j) $\frac{1}{10}, \frac{1}{4}$ k) $\frac{3}{4}, \frac{7}{10}$ l) $\frac{1}{2}, \frac{5}{10}$

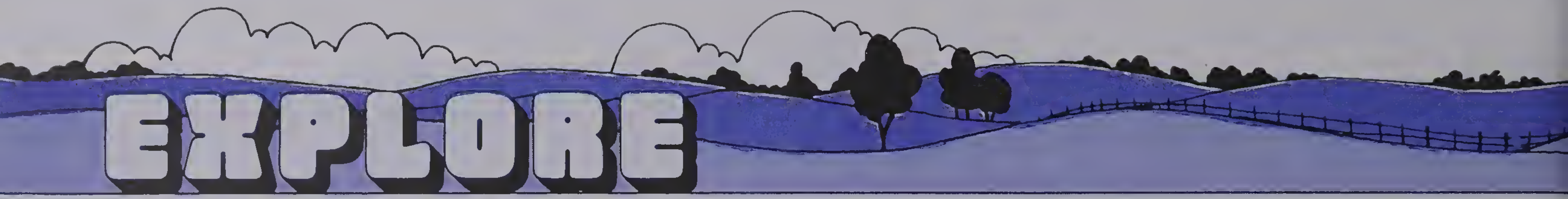
2. Put the fractions in order from greatest to least.

   a) $\frac{2}{4}, \frac{2}{5}, \frac{2}{10}$ b) $\frac{4}{5}, \frac{5}{10}, \frac{1}{4}$ c) $\frac{5}{5}, \frac{3}{4}, \frac{6}{10}$ d) $\frac{3}{5}, \frac{9}{10}, \frac{1}{2}$

3. Sort the fractions in the chart at the top of the page into 3 groups :

   a) fractions less than $\frac{2}{5}$, b) fractions greater than $\frac{2}{5}$, c) fractions equal to $\frac{2}{5}$.

4. Sort the fractions at the top of the page into 2 groups. Explain how you sorted them.

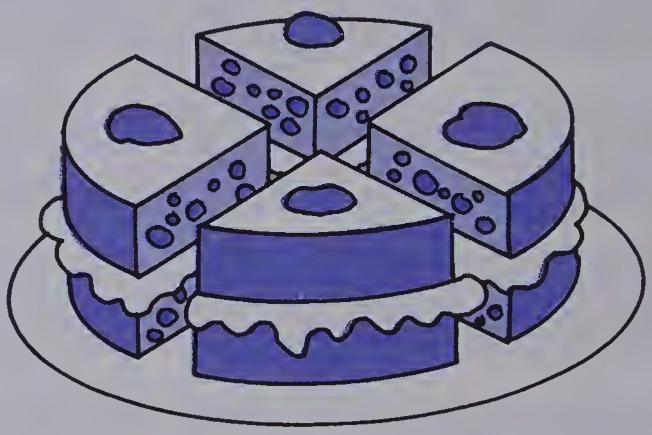


EXPLORE

Adding Fractions

This cake has been cut into 4 equal pieces.

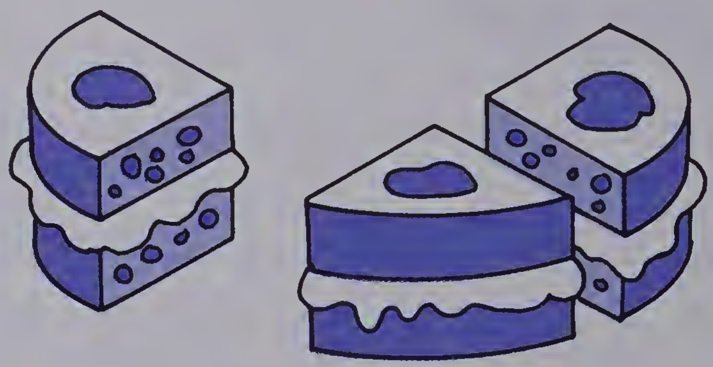
Each piece is $\frac{1}{?}$.



Jennifer eats $\frac{1}{4}$ of the cake.

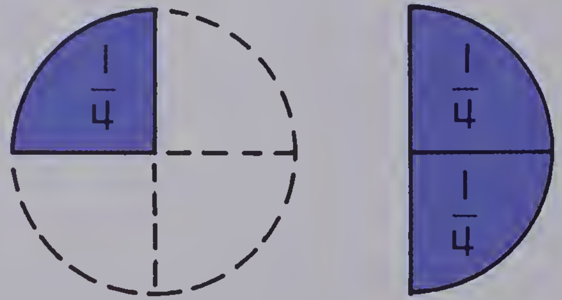
David eats $\frac{2}{4}$ of the cake.

How much of the cake did they eat?



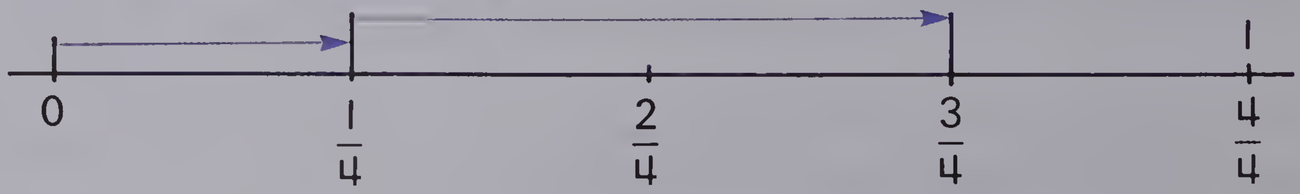
$\frac{1}{4} + \frac{2}{4} = ?$

FRACTIONAL PIES


$\frac{1}{4}$
$\frac{1}{4}$
$\frac{1}{4}$

$\frac{1}{4} + \frac{2}{4} = \frac{?}{4}$

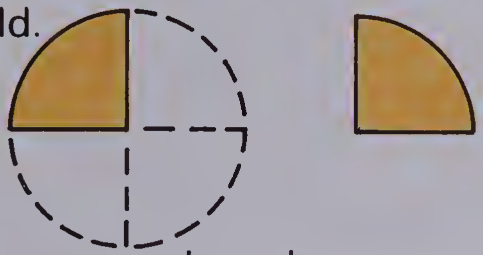
NUMBER LINE


0
$\frac{1}{4}$
$\frac{2}{4}$
$\frac{3}{4}$
$\frac{4}{4}$

IN ACTION

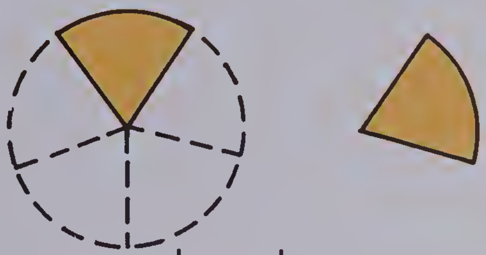
1. Add.

a)



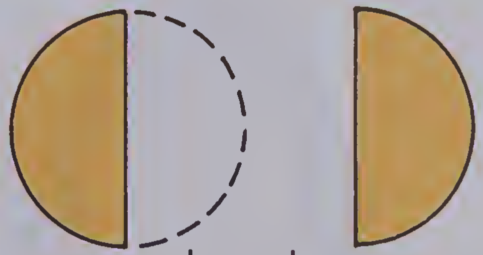
$\frac{1}{4} + \frac{1}{4} = ?$

b)



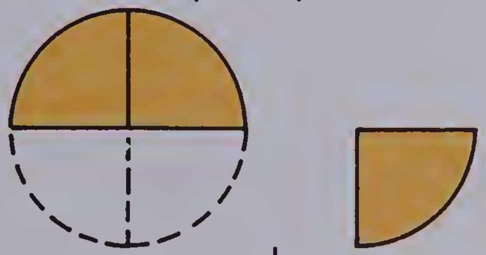
$\frac{1}{5} + \frac{1}{5} = ?$

c)



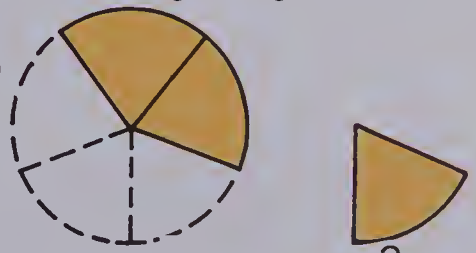
$\frac{1}{2} + \frac{1}{2} = ?$

d)



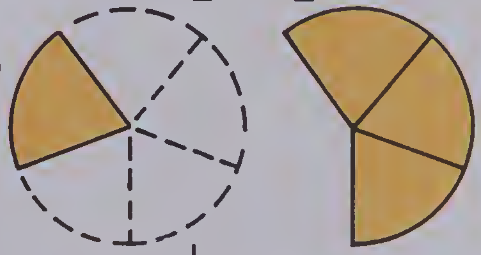
$? + \frac{1}{4} = ?$

e)



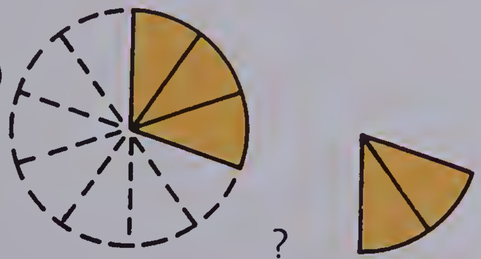
$? + ? = \frac{3}{5}$

f)



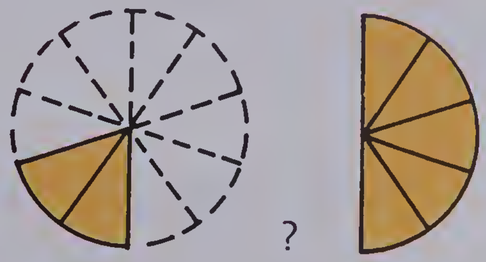
$\frac{1}{5} + ? = ?$

g)



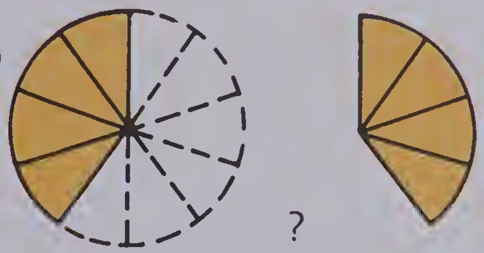
?

h)



?

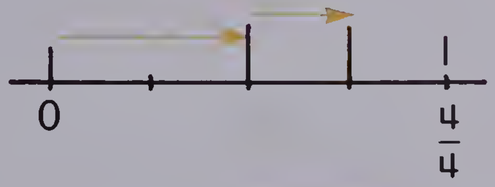
i)



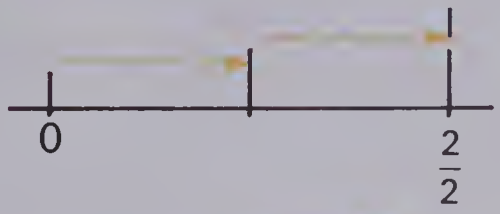
?

2. Add.

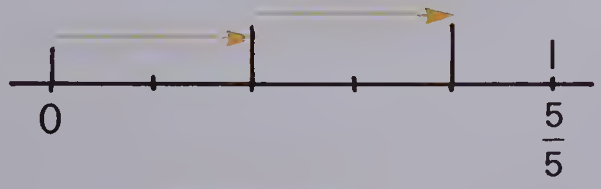
a)



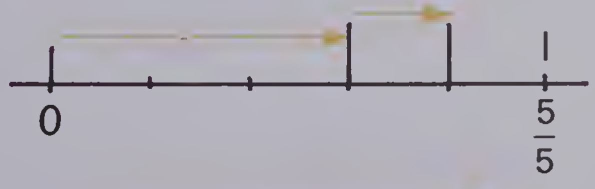
b)



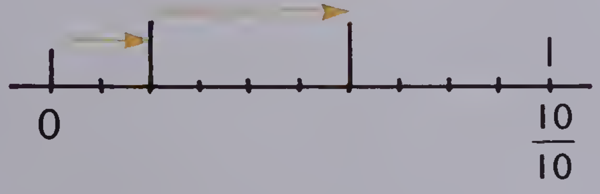
c)



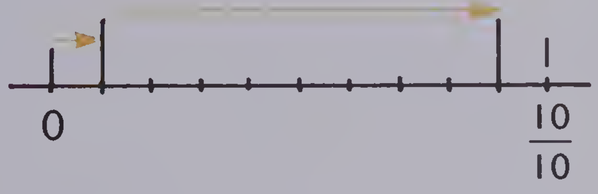
d)



e)



f)

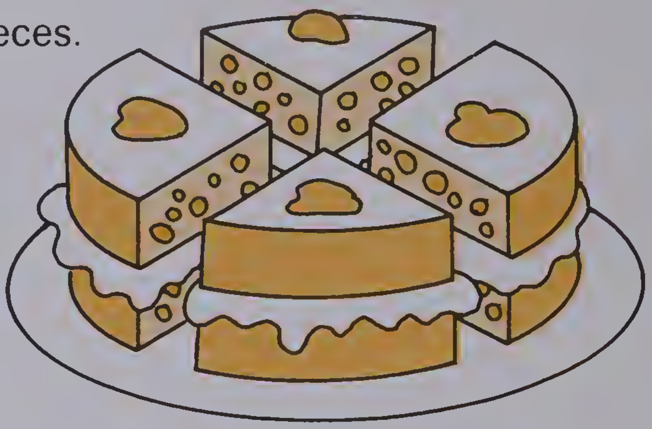


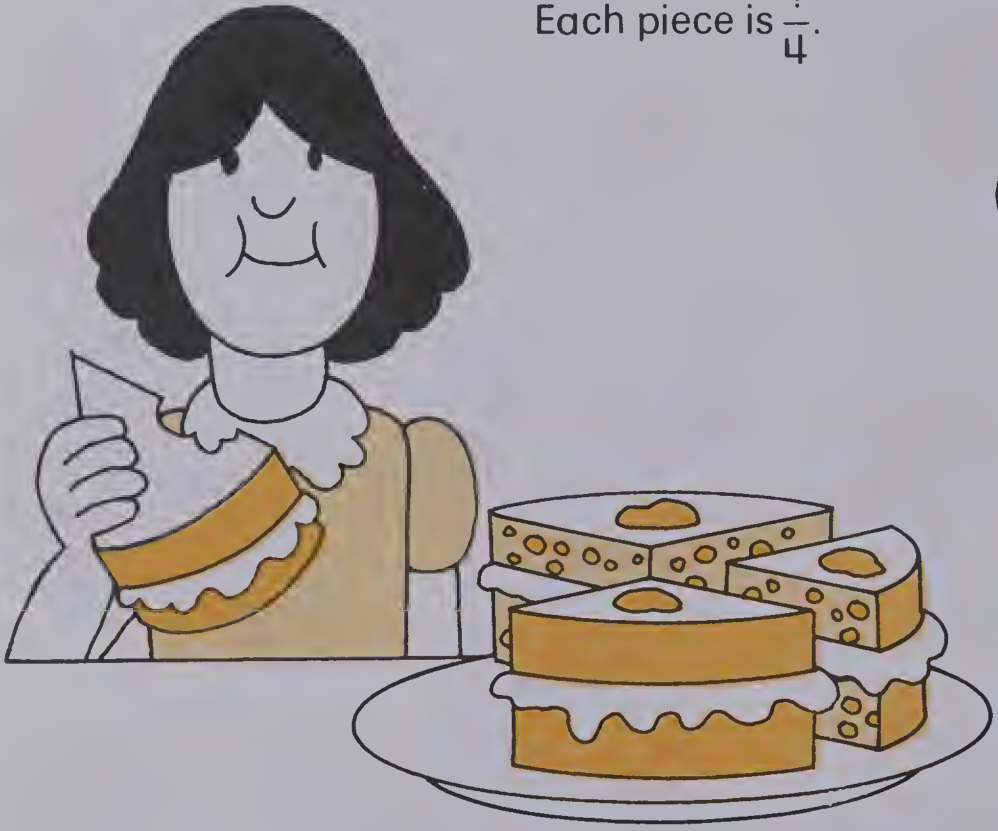
EXPLORE

Subtracting Fractions

This cake has been cut into 4 equal pieces.

Each piece is $\frac{?}{4}$.

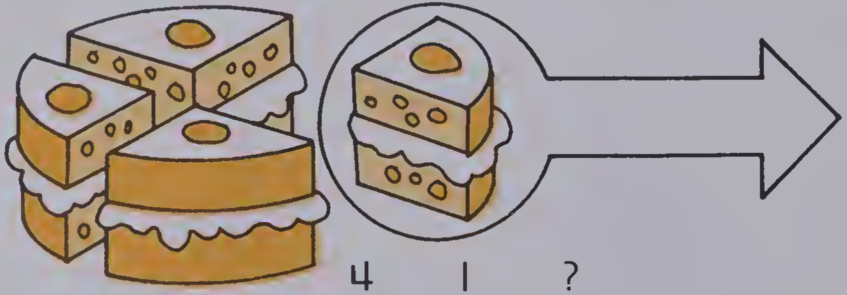




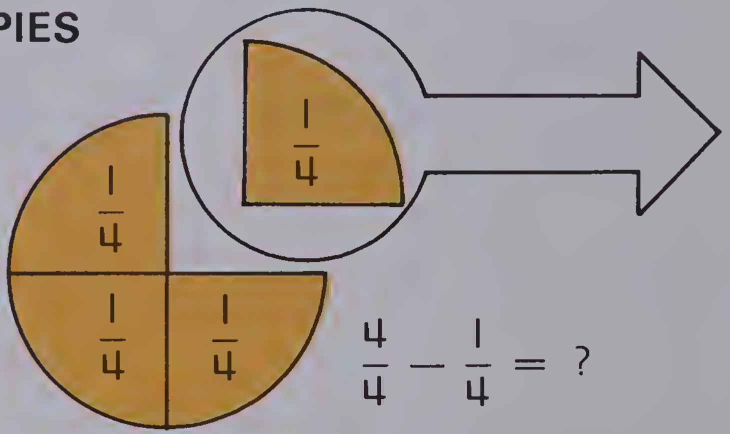
Maika eats $\frac{1}{4}$ of the cake.

How much of the cake is left?

FRACTIONAL PIES

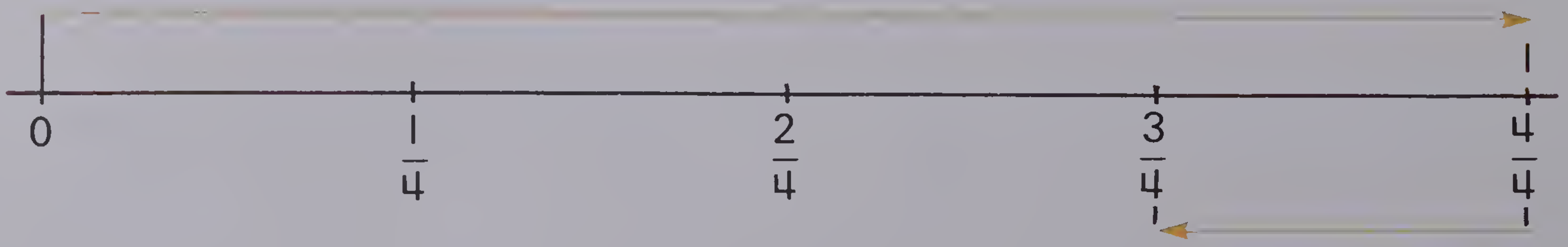


$\frac{4}{4} - \frac{1}{4} = \frac{?}{4}$


$\frac{1}{4}$
$\frac{1}{4}$
$\frac{1}{4}$
$\frac{1}{4}$

$\frac{4}{4} - \frac{1}{4} = ?$

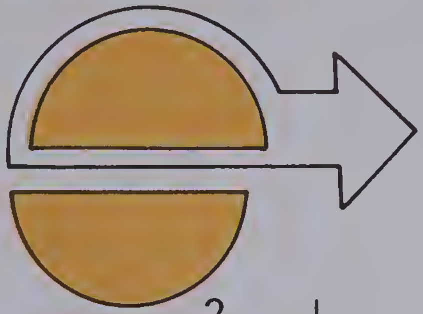
NUMBER LINE


0
$\frac{1}{4}$
$\frac{2}{4}$
$\frac{3}{4}$
$\frac{4}{4}$

IN ACTION

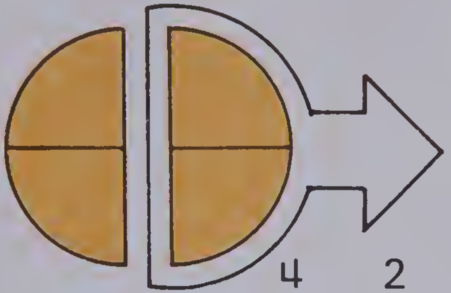
1. Subtract.

a)



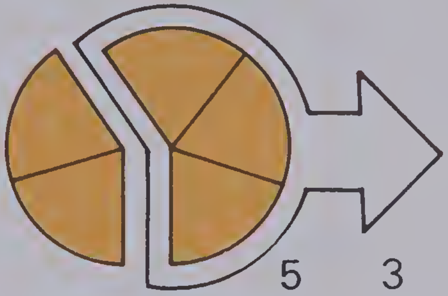
$\frac{2}{2} - \frac{1}{2} = ?$

b)



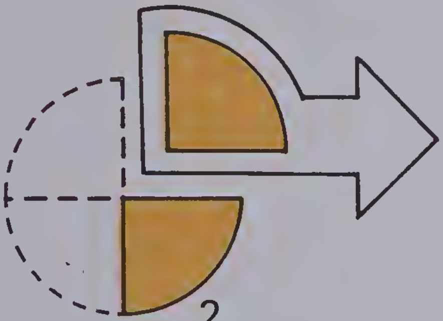
$\frac{4}{4} - \frac{2}{4} = ?$

c)



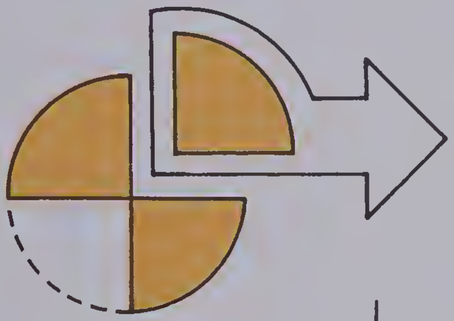
$\frac{5}{5} - \frac{3}{5} = ?$

d)



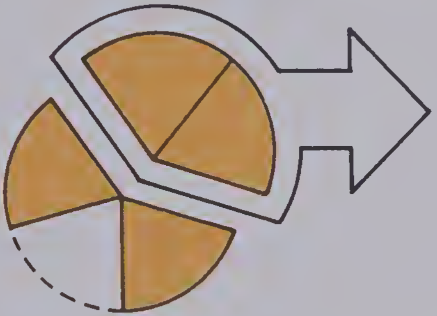
$\frac{2}{4} - ? = ?$

e)



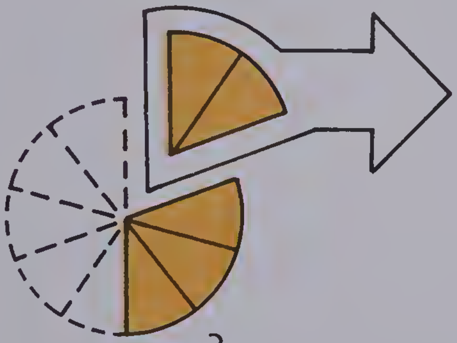
$? - \frac{1}{4} = ?$

f)



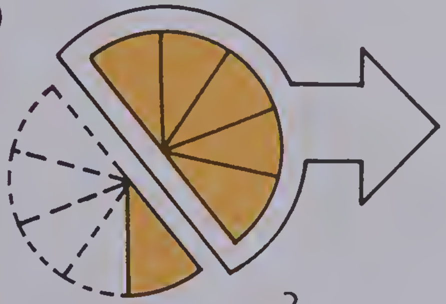
$? - ? = \frac{2}{5}$

g)



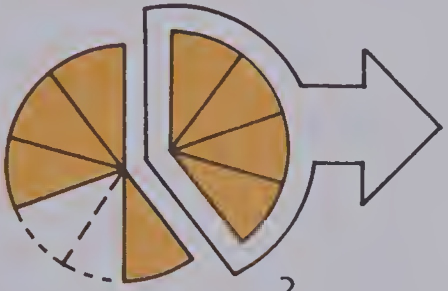
?

h)



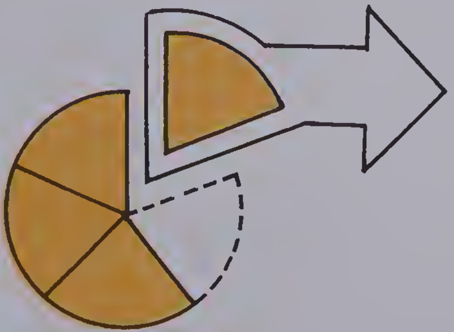
?

i)



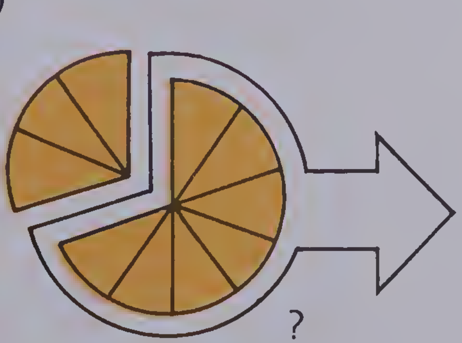
?

j)



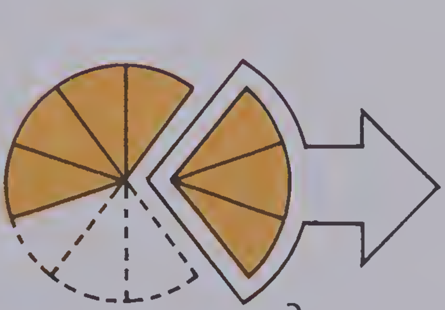
?

k)



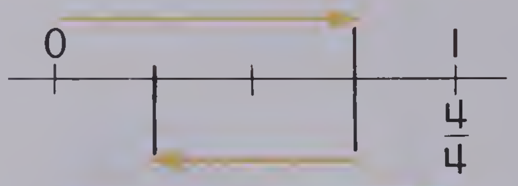
?

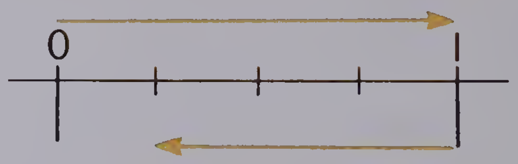
l)

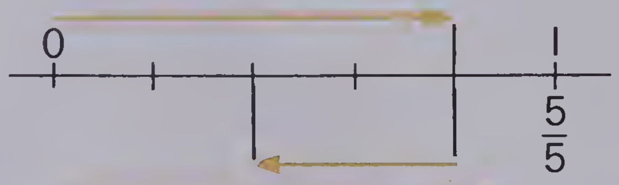


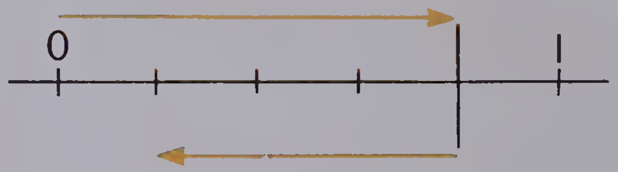
?

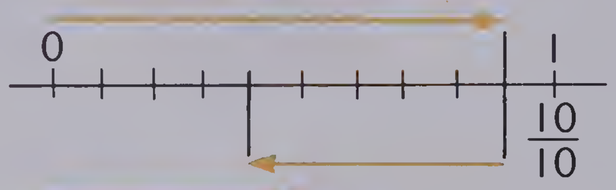
2. Subtract.

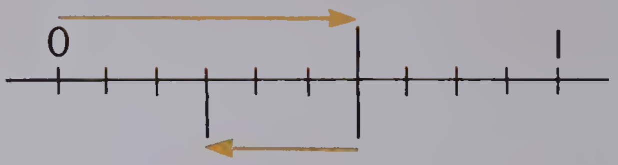
a) 

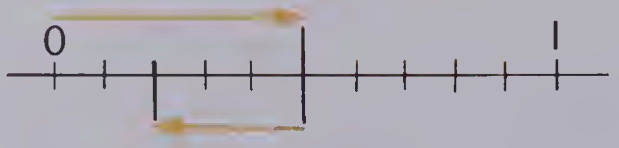
b) 

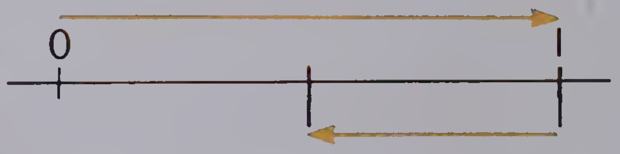
c) 

d) 

e) 

f) 

g) 

h) 

3. Add.

a) $\frac{1}{4} + \frac{1}{4} = ?$ b) $\frac{1}{2} + \frac{1}{2} = ?$ c) $\frac{2}{5} + \frac{1}{5} = ?$ d) $\frac{2}{10} + \frac{3}{10} = ?$

e) $\frac{1}{10} + ? = \frac{5}{10}$ f) $\frac{3}{5} + ? = \frac{5}{5}$ g) $\frac{1}{2} + ? = \frac{2}{2}$ h) $\frac{2}{4} + ? = \frac{3}{4}$

i) $? + \frac{1}{4} = \frac{4}{4}$ j) $? + \frac{2}{10} = \frac{8}{10}$ k) $? + \frac{3}{5} = \frac{4}{5}$ l) $? + \frac{7}{10} = \frac{10}{10}$

4. Subtract.

a) $\frac{2}{2} - \frac{1}{2} = ?$ b) $\frac{2}{4} - \frac{1}{4} = ?$ c) $\frac{4}{5} - \frac{3}{5} = ?$ d) $\frac{6}{10} - \frac{2}{10} = ?$

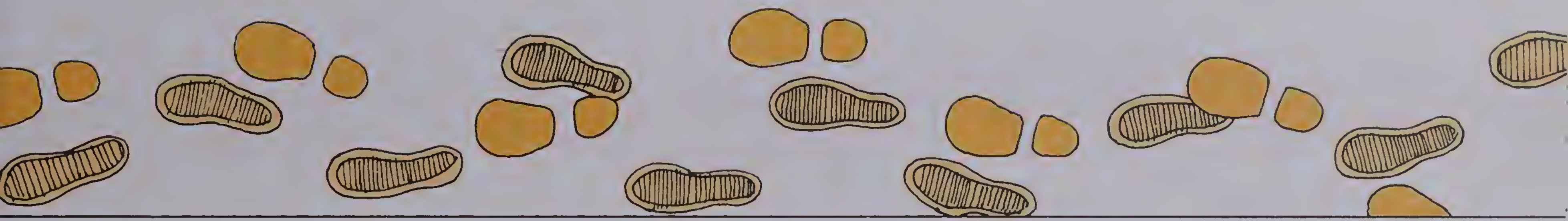
e) $\frac{3}{10} - ? = \frac{1}{10}$ f) $\frac{3}{5} - ? = \frac{2}{5}$ g) $\frac{9}{10} - ? = \frac{4}{10}$ h) $\frac{4}{4} - ? = \frac{2}{4}$

i) $? - \frac{1}{4} = \frac{1}{4}$ j) $? - \frac{2}{10} = \frac{2}{10}$ k) $? - \frac{3}{5} = \frac{2}{5}$ l) $? - \frac{6}{10} = \frac{1}{10}$

5. Complete.

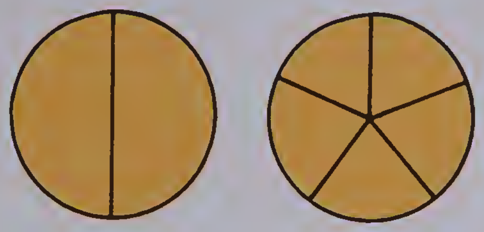
a) $\frac{4}{10} + \frac{3}{10} = ?$ b) $\frac{4}{5} + \frac{1}{5} = ?$ c) $\frac{3}{4} - \frac{2}{4} = ?$ d) $\frac{2}{5} - \frac{2}{5} = ?$

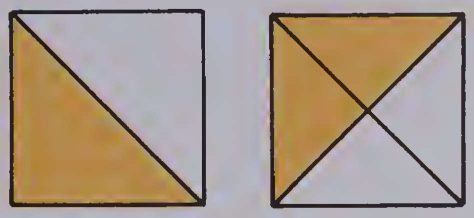
e) $\frac{4}{5} - ? = \frac{1}{5}$ f) $\frac{8}{10} - ? = \frac{1}{10}$ g) $\frac{5}{10} + ? = \frac{9}{10}$ h) $\frac{1}{4} + ? = \frac{4}{4}$

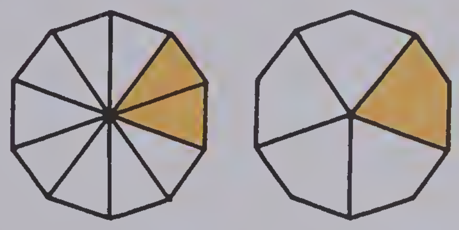


Retrace Your Steps

1. Write the equivalent fractions.

a)


b)


c)


2. Complete.

a) $\frac{?}{2} = \frac{2}{4}$ b) $\frac{3}{5} = \frac{?}{10}$

c) $\frac{2}{2} = ?$ d) $\frac{?}{4} = \frac{10}{10}$

3. Write fractions equivalent to:

a) $\frac{1}{2}$ b) $\frac{3}{5}$ c) $\frac{5}{5}$ d) $\frac{8}{10}$

4. Write a sentence using $>$ or $<$.

a) $\frac{3}{5}, \frac{7}{10}$ b) $\frac{2}{2}, \frac{9}{10}$ c) $\frac{1}{4}, \frac{3}{10}$ d) $\frac{7}{10}, \frac{3}{4}$ e) $\frac{5}{10}, \frac{2}{5}$ f) $\frac{1}{2}, \frac{4}{10}$

5. Add.

a) $\frac{1}{2} + \frac{1}{2} = ?$ b) $\frac{1}{4} + \frac{2}{4} = ?$ c) $\frac{3}{5} + \frac{1}{5} = ?$ d) $\frac{6}{10} + \frac{2}{10} = ?$

e) $\frac{1}{4} + ? = \frac{2}{4}$ f) $\frac{2}{5} + ? = \frac{4}{5}$ g) $? + \frac{3}{10} = \frac{7}{10}$ h) $? + \frac{5}{10} = \frac{6}{10}$

6. Subtract.

a) $\frac{2}{2} - \frac{1}{2} = ?$ b) $\frac{4}{4} - \frac{2}{4} = ?$ c) $\frac{5}{5} - \frac{4}{5} = ?$ d) $\frac{10}{10} - \frac{3}{10} = ?$

e) $\frac{3}{4} - ? = \frac{1}{4}$ f) $\frac{4}{5} - ? = \frac{3}{5}$ g) $? - \frac{4}{10} = \frac{8}{10}$ h) $? - \frac{2}{10} = 0$

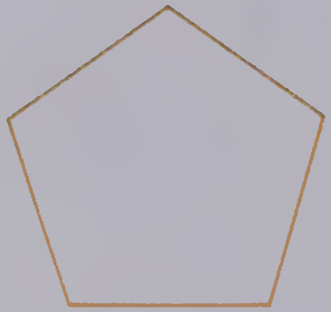
7. Complete.

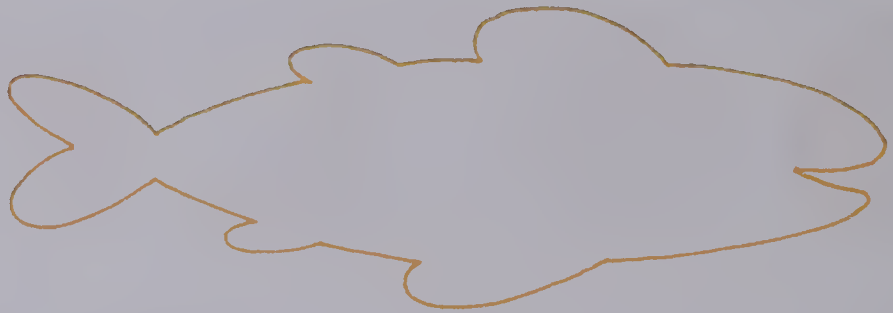
a) $\frac{2}{5} + \frac{1}{5} = ?$ b) $\frac{1}{4} + \frac{3}{4} = ?$ c) $\frac{9}{10} - \frac{4}{10} = ?$ d) $\frac{4}{5} - \frac{1}{5} = ?$

e) $\frac{1}{2} + ? = 1$ f) $\frac{3}{5} - ? = 0$ g) $? + \frac{3}{4} = 1$ h) $? - \frac{7}{10} = 0$

Open and Closed Curves

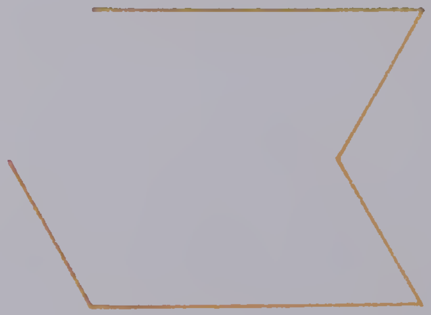
What do each of these figures have in common?

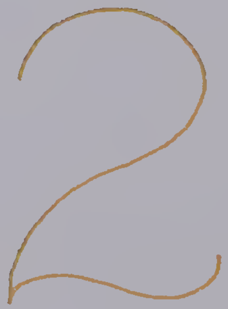




You can start at any point of either figure
and trace it, travelling to every other point exactly once
before returning to where you began.
These figures are called
simple closed curves.

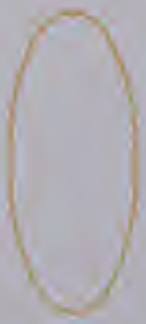
What do each of these figures have in common?

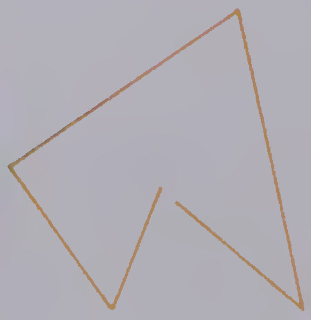


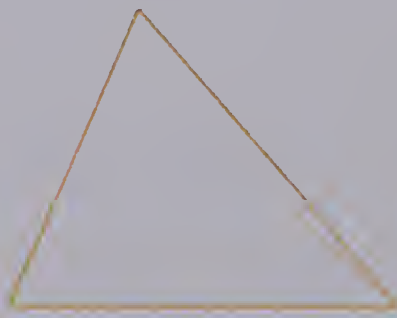


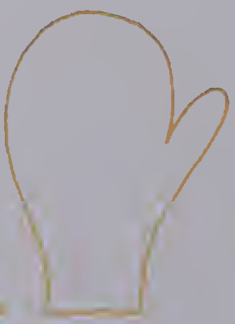
These figures are called
open curves.

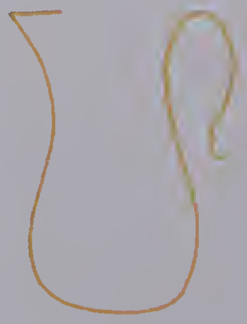
Which of these are open curves?
Which are simple closed curves?

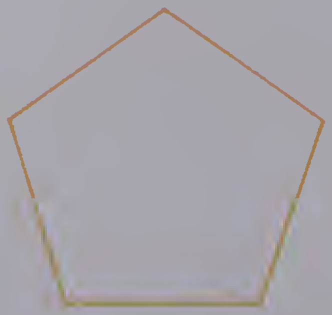










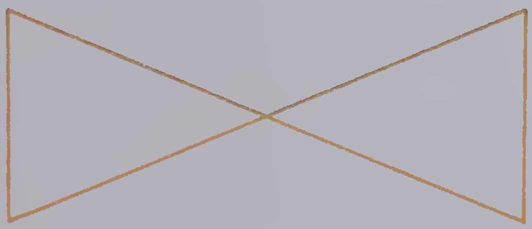


IN ACTION

1. Which of these letters
are simple closed curves?
Which letters are open curves?

C D G I J L M N O S U V W Z

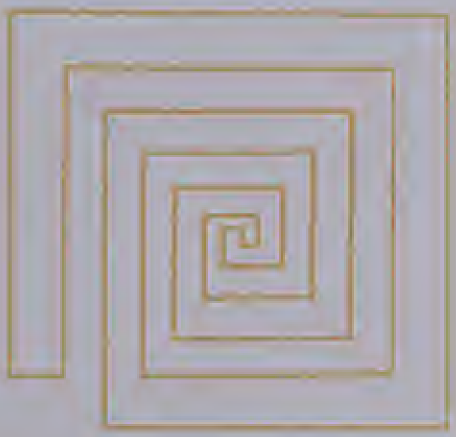
2. Is this a simple closed curve?
Explain your answer.



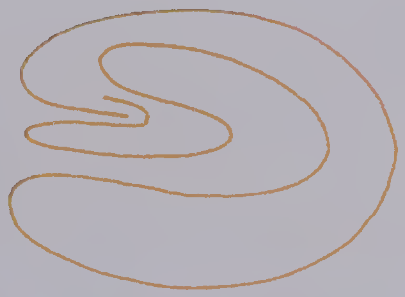
3. Draw some simple closed and open curves.
Label each one open or closed.

4. Are these curves open or closed?

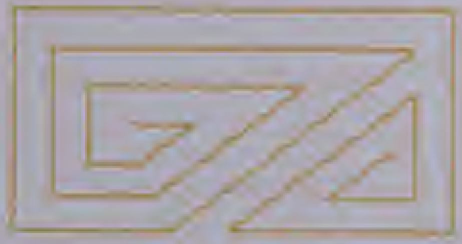
a)



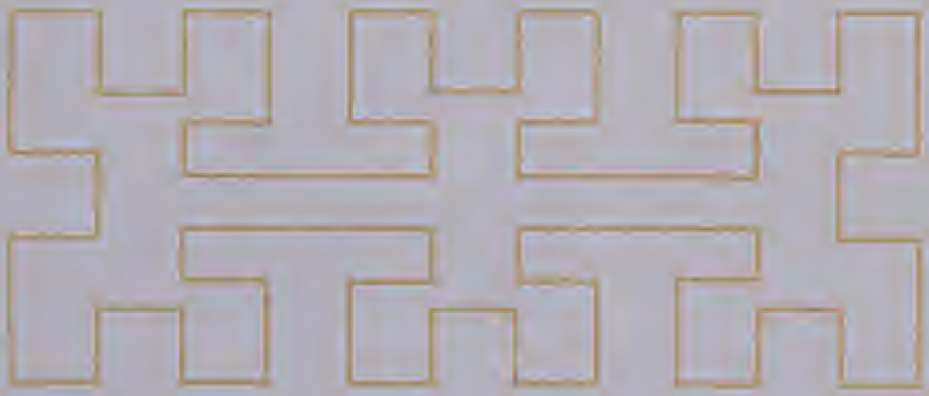
b)



c)



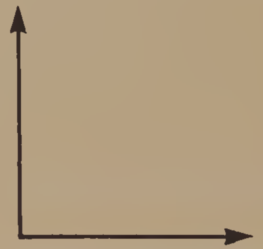
d)



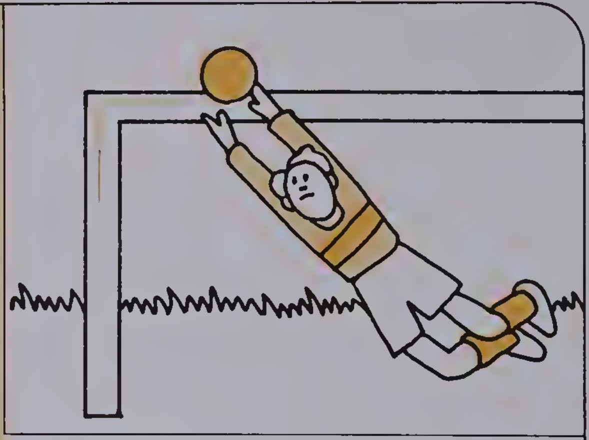
EXPLORE

Angles

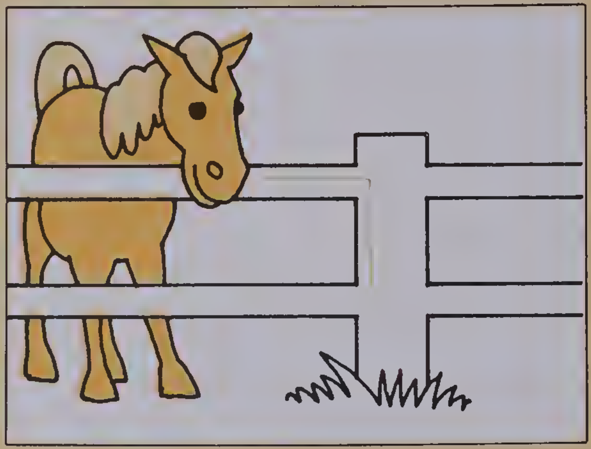
What do you think of
when you see a figure like this?



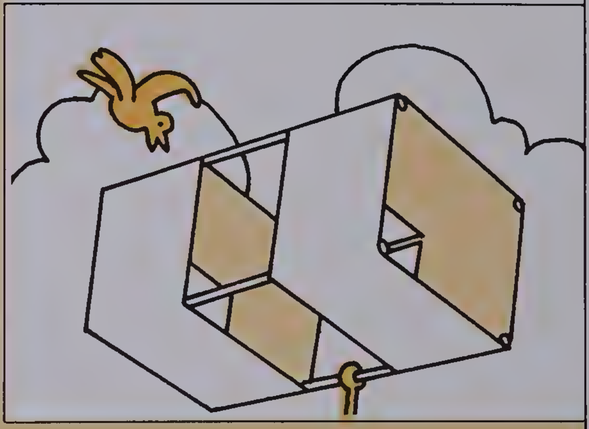
Do you think of this?



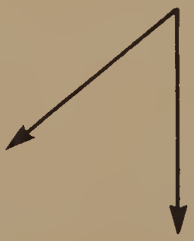
or this?



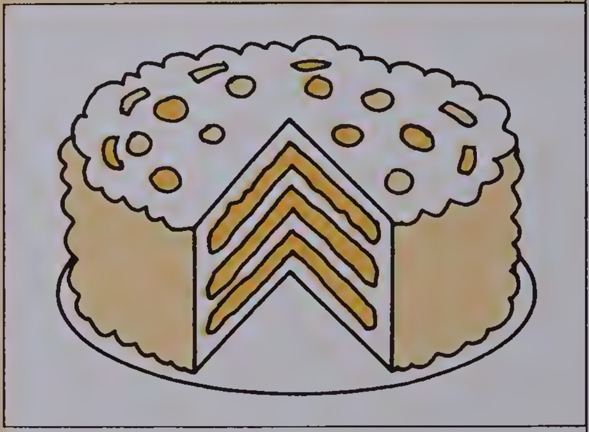
or this?



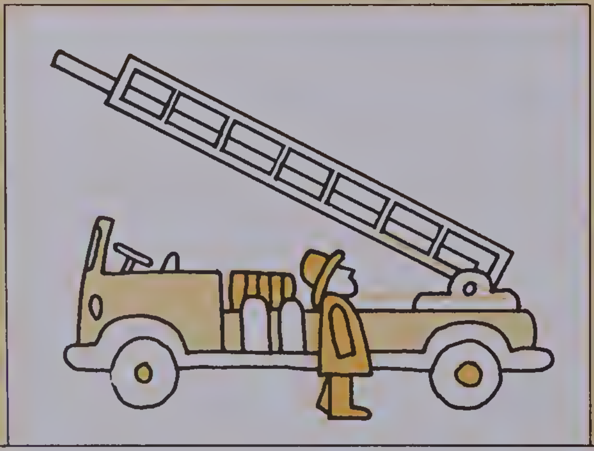
What do you think of
when you see a figure like this?



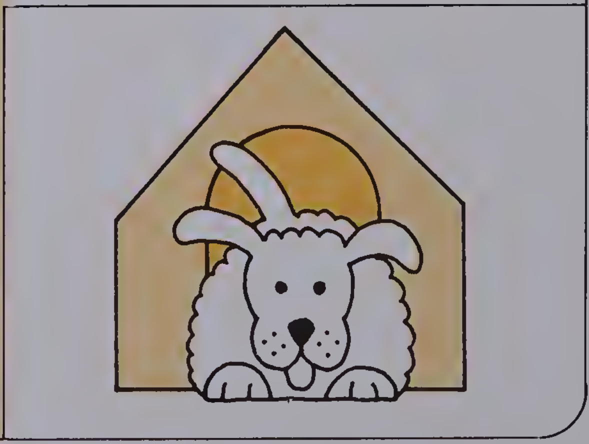
Do you think of this?



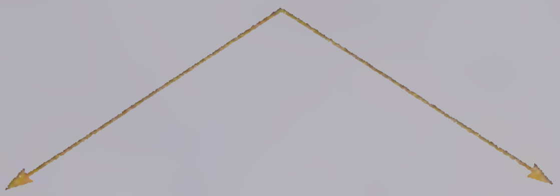
or this?



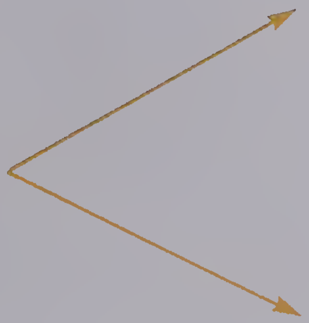
or this?

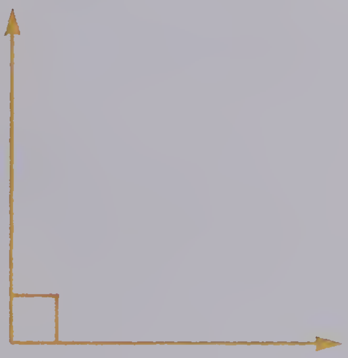


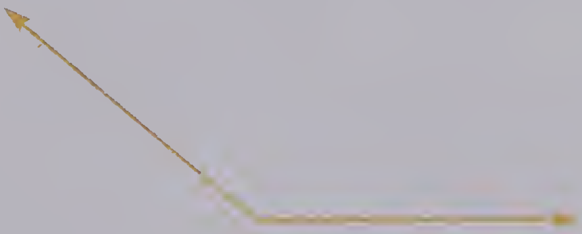
Write a list of things you think of
when you see a figure like this.
Look out the window or in a magazine
to get some ideas.



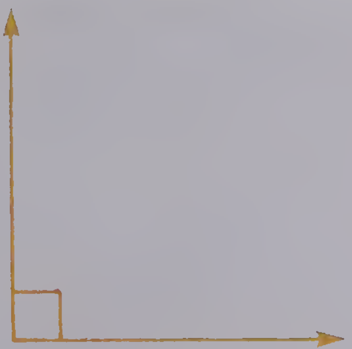
Figures like these are called **angles.**



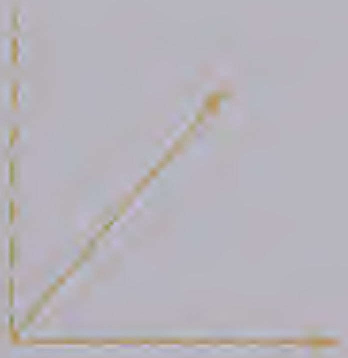




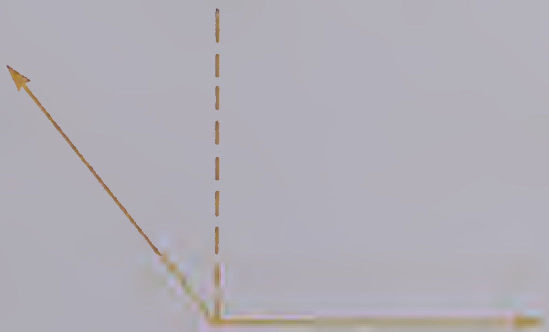
This is a special angle.
It is called a **right angle.**



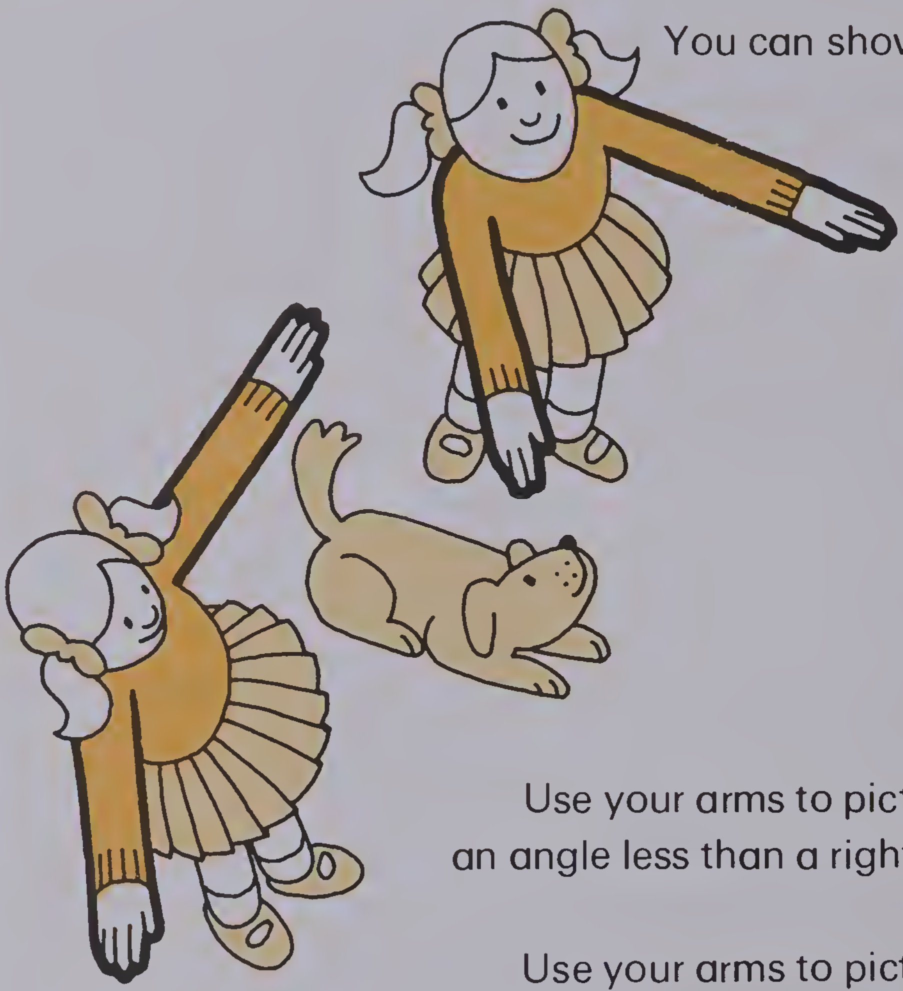
This angle is less
than a right angle.

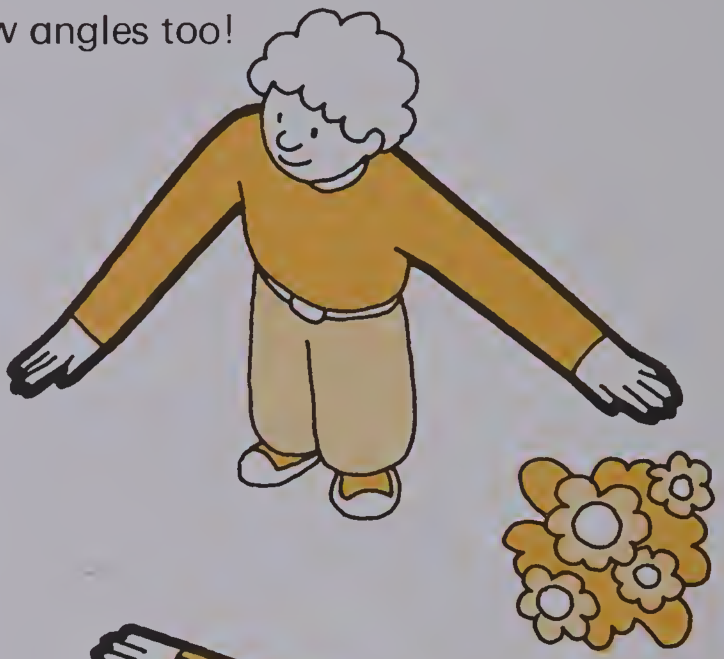


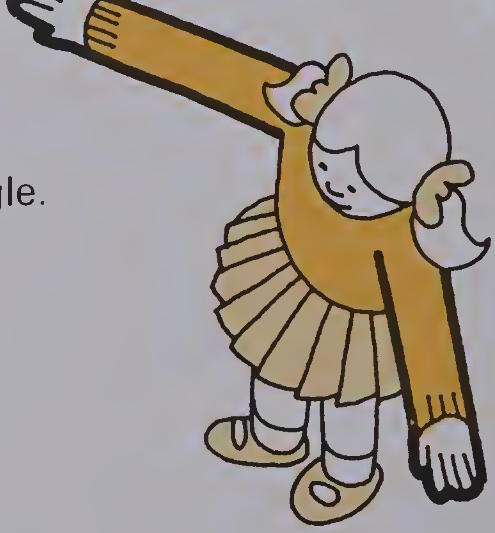
This angle is greater
than a right angle.



You can show angles too!





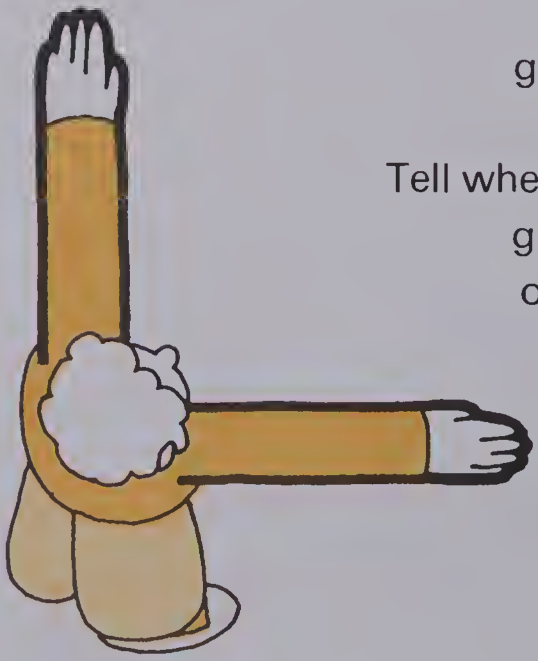


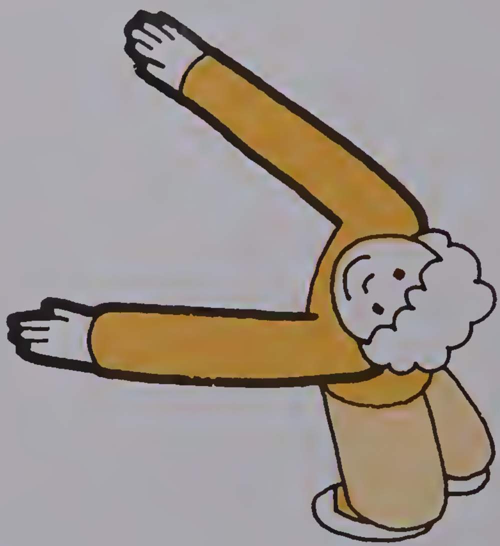
Use your arms to picture
an angle less than a right angle.

Use your arms to picture
a right angle.

Show an angle
greater than a right angle.

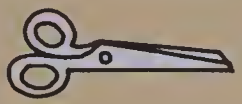
Tell whether each angle is a right angle,
greater than a right angle,
or less than a right angle.



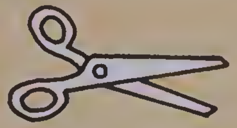


EXPLORE

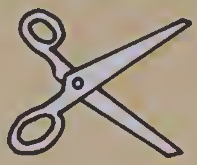
Generating Angles



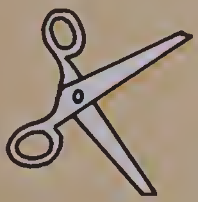
These scissors
are closed.



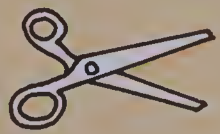
When we open the scissors
we **generate** an angle.



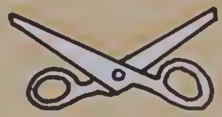
We can generate
different angles.



We can generate
a right angle.

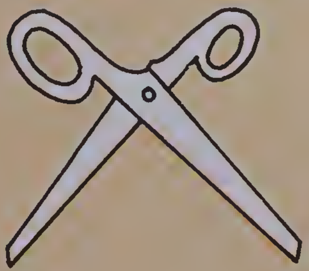


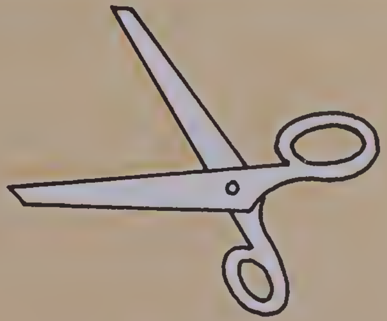
We can generate
an angle less than
a right angle.

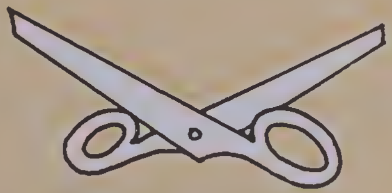


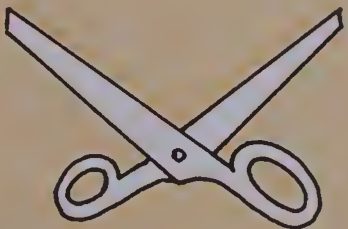
We can generate
an angle greater than
a right angle.

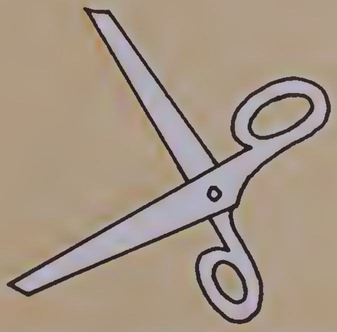
Tell whether each of these is
a right angle, greater than a right angle,
or less than a right angle.

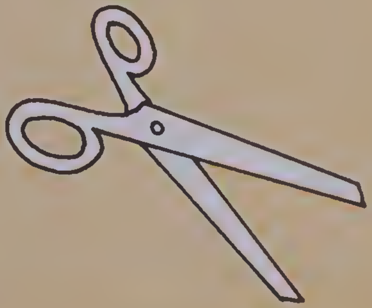






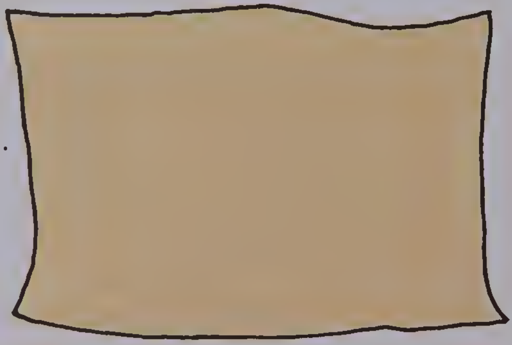


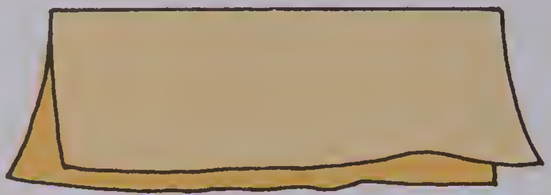




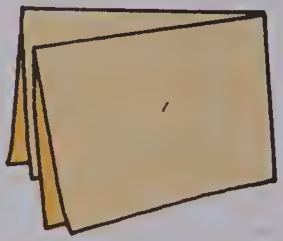
IN ACTION

1. Take any piece of paper.
Newspaper will do.





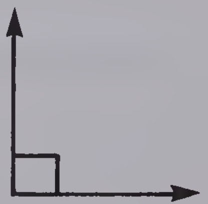
Fold it into
2 parts.



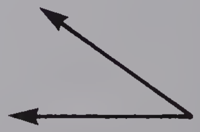
Now fold the paper again
so that the folded edge
laps over itself.

You have folded
a right angle!
Use it as an **angle gauge**!

Use your gauge to find some angles like this

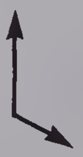


and like this.

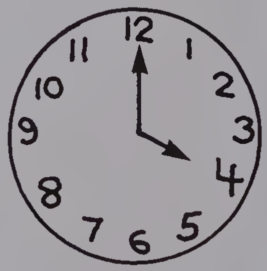


Make a list of the angles you find.

2. This is the angle shown by the hands of the clock at 04:00.

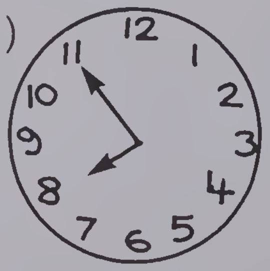


Is it greater
than a right
angle?



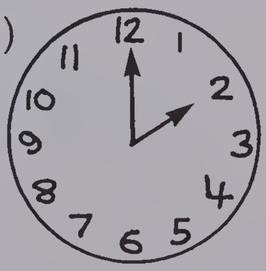
Tell whether the angle shown by the hands
on each clock is a right angle,
greater than a right angle, or less than a right angle.

a)



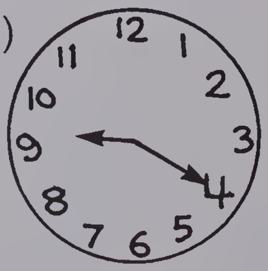
07:55

b)



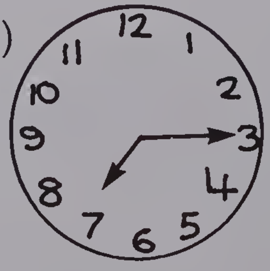
02:00

c)



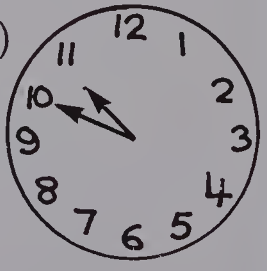
09:20

d)



07:15

e)

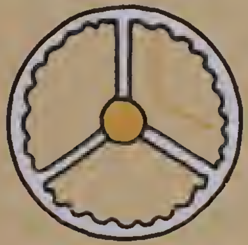
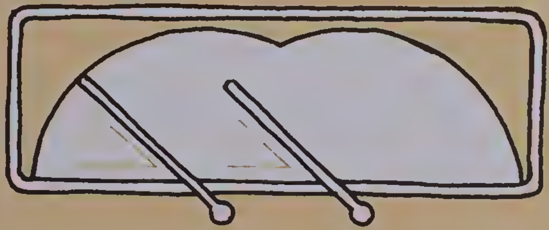
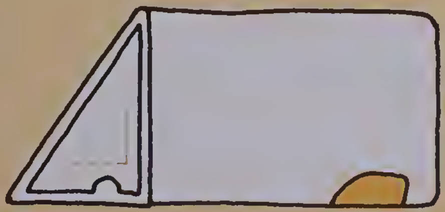
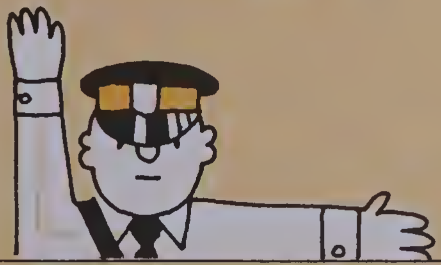
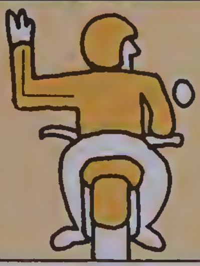


10:50

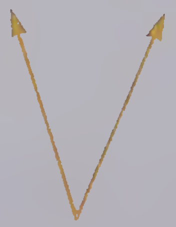
3. Draw the angles shown by clock hands when the clock reads :

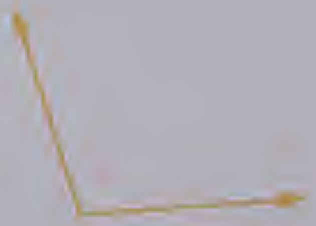
a) 02:30	b) 10:45	c) 03:25	d) 06:10
e) 02:05	f) 01:00	g) 03:20	h) 08:15
i) 12:25	j) 10:15	k) 07:30	l) 12:15

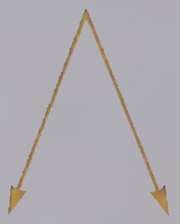
4. Look at the angles marked in each picture. Complete the chart.

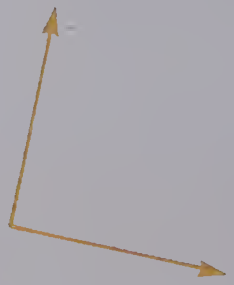
Picture	Right angle	Greater than a right angle	Less than a right angle
			
			
			
			
			

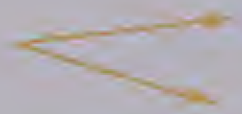
5. Which angles are greater than a right angle?
Which angles are less than a right angle?
Which angles are right angles?
Use your angle gauge to help check.

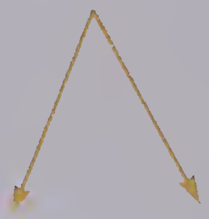
a)


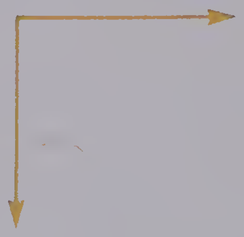
b)


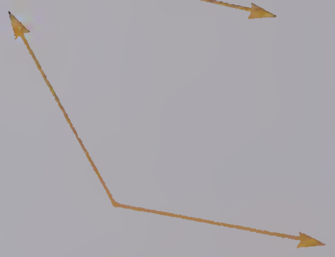
c)


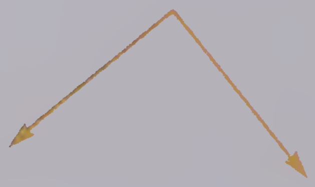
d)


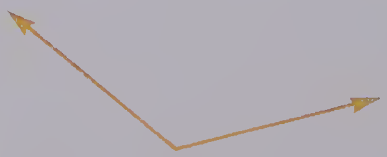
e)


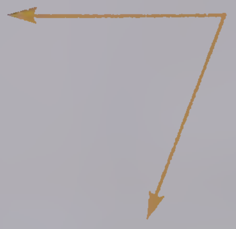
f)


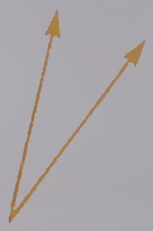
g)


h)


i)


j)


k)


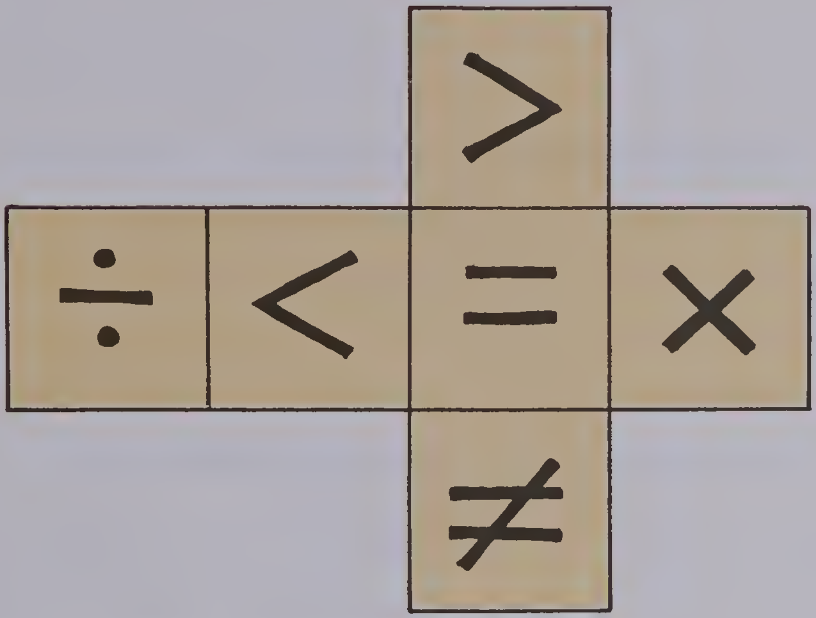
l)


6. Copy and complete the chart.

Shape	Number of right angles	Number of angles greater than a right angle	Number of angles less than a right angle
Square			
Regular hexagon			
Parallelogram			
Equilateral triangle			
Rhombus			
Regular pentagon			
Regular octagon			

Floating Faces

Suppose you folded
this pattern together.
What geometric model
would you make?



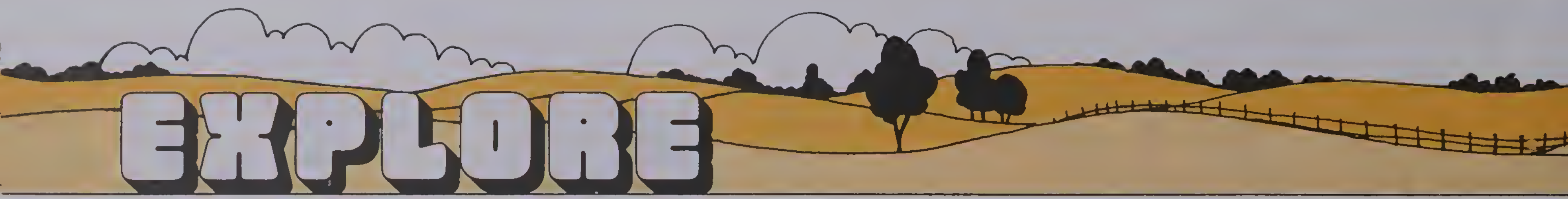
Imagine that the symbol in the first column of the chart
is on the **front** face of the cube.
Complete the chart in your notebook.

Front face	Back face	Top face	Bottom face	Right face	Left face
×					
÷					
=					
≠					
>					
<					

Make a cube like the one above to check your answers.

Draw another pattern for a cube.
Mark each face with a symbol or picture.
Make a chart like the one above
for a friend to complete.

Examine an ordinary die. What patterns can you discover?



Changing the Order of Operations

Is	Is	Is	Is
12 + 6 = 6 + 12	12 − 6 = 6 − 12	12 × 6 = 6 × 12	12 ÷ 6 = 6 ÷ 12

Repeat this exploration for at least 3 other number pairs.

Do you agree we can add or multiply 2 numbers in either order?

Does the same rule hold for subtraction or division?

The **either-order rule** shortens the work on addition facts and multiplication facts.

In each case you need to memorize only half the facts in the chart.

How many facts do you need to know for each chart?

+	1	2	3	4	5	6	7	8	9	10
1	2								9	
2		4				8				
3			6							
4				8					13	
5					10					
6		8				12				
7							14			
8	9							16		
9				13					18	
10										20

Addition Chart

×	1	2	3	4	5	6	7	8	9	10
1	1									
2		4		8						
3			9					24		
4		8		16						
5					25					
6						36				60
7							49			
8			24					64		
9									81	
10						60				100

Multiplication Chart

IN ACTION

1. Solve.

a) $n + 9 = 7 + 9$

b) $k + 4 = 4 + 8$

c) $p + 39 = 17 + 39$

d) $q + 87 = 87 + 91$

e) $m + 142 = 142 + 357$

f) $a + 476 = 476 + 350$

g) $e + 129 = 4376 + 129$

h) $w + 648 = 648 + 9072$

2. Solve.

a) $n \times 13 = 13 \times 19$

b) $p \times 82 = 43 \times 82$

c) $q \times 49 = 49 \times 126$

d) $k \times 264 = 264 \times 95$

e) $m \times 99 = 99 \times 198$

f) $a \times 167 = 167 \times 219$

g) $f \times 741 = 741 \times 217$

h) $y \times 1764 = 1764 \times 39$

Changing the Order of Operations

Explore. Complete in the order shown by the brackets.

Is $12 + (6 + 2) = (12 + 6) + 2$

Is $12 - (6 - 2) = (12 - 6) - 2$

Is $12 \times (6 \times 2) = (12 \times 6) \times 2$

Is $12 \div (6 \div 2) = (12 \div 6) \div 2$

Repeat this exploration for these numbers.

a) 18, 6, 3 b) 24, 12, 6 c) 20, 10, 2

Do you agree we can add or multiply 3 numbers in any order?

Does the same rule hold for subtraction or division?

We can change the order to simplify calculations.

$39 \times 25 \times 4$ is easy if we multiply it this way.

$$39 \times (25 \times 4)$$
$$= 39 \times 100$$
$$= 3900$$

IN ACTION

1. Which order would you use? Record the result.
   a) $(4 + 6) + 9$ or $4 + (6 + 9)$
   b) $1 + (99 + 78)$ or $(1 + 99) + 78$
   c) $(437 + 13) + 20$ or $437 + (13 + 20)$
   d) $16 \times (5 \times 2)$ or $(16 \times 5) \times 2$
   e) $(25 \times 4) \times 9$ or $25 \times (4 \times 9)$
   f) $(50 \times 2) \times 19$ or $50 \times (2 \times 19)$

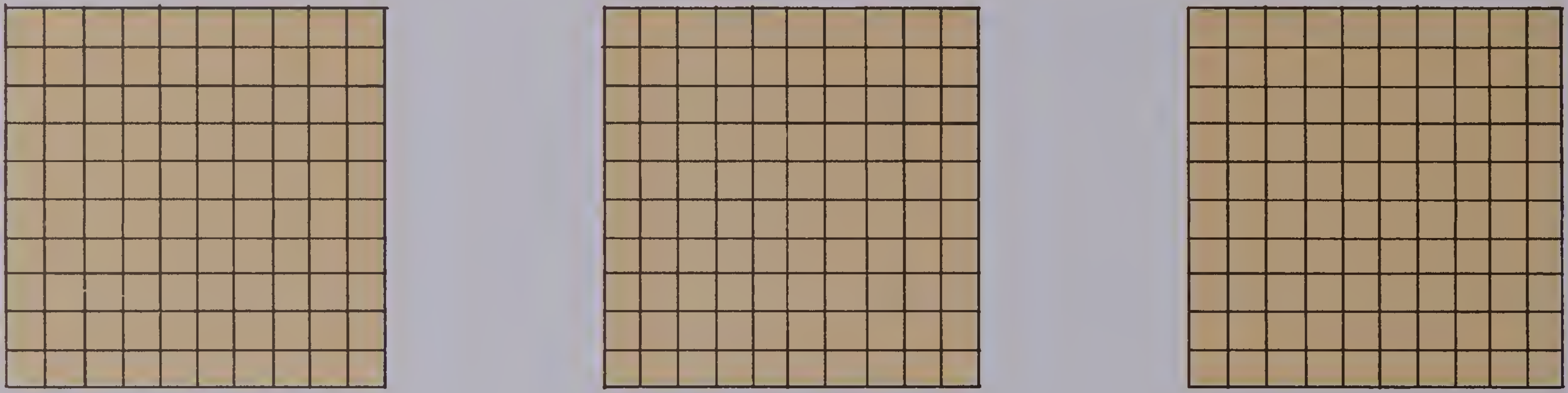
2. Find the sums. Show the order you used.
   a) $437 + 63 + 127$
   b) $716 + 49 + 51$
   c) $943 + 57 + 857$
   d) $241 + 259 + 666$
   e) $501 + 79 + 99$
   f) $861 + 49 + 39$

3. Find the products. Show the order you used.
   a) $50 \times 2 \times 7$
   b) $99 \times 2 \times 5$
   c) $25 \times 4 \times 37$
   d) $87 \times 50 \times 2$
   e) $6 \times 100 \times 9$
   f) $5 \times 200 \times 19$
   g) $20 \times 89 \times 5$
   h) $40 \times 17 \times 25$

4. Solve.
   a) $n + 7 + 9 = 9 + 12 + 7$
   b) $13 + k + 14 = 18 + 13 + 14$
   c) $16 + 19 + p = 13 + 16 + 19$
   d) $r \times 9 \times 11 = 11 \times 9 \times 13$
   e) $21 \times 27 \times w = 21 \times 14 \times 27$
   f) $47 \times y \times 18 = 37 \times 47 \times 18$

EXPLORE

Multiplying by 100



100 + 100 + 100 = 300

OR 3 × 100 = 300

IN ACTION

1. Complete the patterns.

   a) 7 × 1 = ?
   7 × 10 = ?
   7 × 100 = ?

   b) 9 × 1 = ?
   9 × 10 = ?
   9 × 100 = ?

   c) 12 × 1 = ?
   12 × 10 = ?
   12 × 100 = ?

   d) 37 × 1 = ?
   37 × 10 = ?
   37 × 100 = ?

2. Find the products.

   a) 17 × 100 b) 24 × 100 c) 43 × 100 d) 58 × 100 e) 71 × 100 f) 35 × 100
   g) 19 × 100 h) 39 × 100 i) 64 × 100 j) 87 × 100 k) 99 × 100 l) 75 × 100

3. How many cents?

   a) \$5 b) \$7 c) \$12 d) \$18 e) \$35 f) \$87 g) \$95 h) \$46

4. How many centimetres?

   a) 6 m b) 7 m c) 9 m d) 12 m e) 15 m f) 25 m g) 40 m h) 33 m

5. There are 8 levels in the parking garage. Each level holds 100 cars.
   How many cars does the parking garage hold?

EXPLORE

Dividing by 100

Since 3 × 100 = 300, then 300 ÷ 100 = 3

Since 17 × 100 = 1700, then 1700 ÷ 100 = 17

IN ACTION

1. Complete.

a) 8 × 100 = 800
800 ÷ 100 = ?

b) 11 × 100 = ?
? ÷ 100 = ?

c) 18 × 100 = ?
? ÷ 100 = ?

d) 27 × 100 = ?
? ÷ 100 = ?

e) 50 × 100 = ?
? ÷ 100 = ?

f) 36 × 100 = ?
? ÷ 100 = ?

g) 49 × 100 = ?
? ÷ 100 = ?

h) 62 × 100 = ?
? ÷ 100 = ?

2. Complete the patterns.

a) 12 ÷ 1 = ?
120 ÷ 10 = ?
1200 ÷ 100 = 12

b) 9 ÷ 1 = ?
90 ÷ 10 = ?
900 ÷ 100 = ?

c) 16 ÷ 1 = ?
160 ÷ 10 = ?
1600 ÷ 100 = ?

d) 23 ÷ 1 = ?
? ÷ 10 = ?
? ÷ 100 = ?

e) 35 ÷ 1 = ?
350 ÷ 10 = ?
? ÷ 100 = ?

f) 47 ÷ 1 = ?
? ÷ 10 = ?
? ÷ 100 = ?

g) 61 ÷ 1 = ?
? ÷ 10 = ?
? ÷ 100 = ?

h) 86 ÷ 1 = ?
860 ÷ 10 = ?
8600 ÷ 100 = ?

3. Find the answers.

a) 500 ÷ 100 b) 1200 ÷ 100 c) 2100 ÷ 100 d) 3700 ÷ 100 e) 6300 ÷ 100
f) 7500 ÷ 100 g) 8200 ÷ 100 h) 9100 ÷ 100 i) 100 ÷ 100 j) 1000 ÷ 100

4. How many dollars?

a) 400¢ b) 1000¢ c) 1200¢ d) 2500¢ e) 4000¢ f) 5000¢

5. How many metres?

a) 100 cm b) 200 cm c) 400 cm d) 900 cm e) 1200 cm f) 1000 cm
g) 2500 cm h) 4000 cm i) 3500 cm j) 5300 cm k) 7500 cm l) 6200 cm

Multiplication/A 3-Digit Factor and a 1-Digit Factor

Multiply 172 by 9.

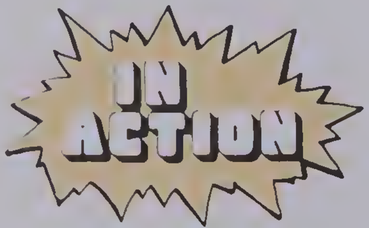
We can estimate the product this way.
172 is about 170
9 is about 10
172 × 9 is about 170 × 10 or 1700

Here is one way of completing the multiplication.

$$\begin{array}{rcrcrcr} 172 & = & 100 & + & 70 & + & 2 \\ 172 \times 9 & = & 100 & + & 70 & + & 2 \\ & & & & & & 9 \\ \hline & & 900 & + & 630 & + & 18 \\ & & & & & = & 1548 \end{array}$$

The estimate is 1700.
The calculated answer is 1548.
The result is reasonable.

Suppose, in adding 900, 630 and 18, you obtained 981.
Your estimate would show that you had made a mistake.



1. Record only your estimate.
   - a) 191 × 9 is about 190 × 10 or ?
   - b) 123 × 8 is about 120 × 10 or ?
   - c) 175 × 6 is about 180 × 5 or ?
   - d) 132 × 9 is about 130 × 10 or ?
   - e) 169 × 8 is about ? × ? or ?
   - f) 154 × 7 is about ? × ? or ?
   - g) 149 × 3 is about ? × 3 or ?
   - h) 118 × 6 is about ? × 5 or ?
   - i) 187 × 4 is about ? × ? or ?
   - j) 109 × 5 is about ? × ? or ?

2. Estimate and then find the product.
   a) 173 × 6 b) 156 × 7 c) 124 × 4 d) 189 × 8 e) 197 × 9 f) 139 × 5
   g) 119 × 3 h) 129 × 9 i) 179 × 5 j) 168 × 7 k) 191 × 8 l) 142 × 6

EXPLORE

Multiplication/A 3-Digit Factor and a 1-Digit Factor

Multiply 167 by 8.

The product is certainly less than 170 × 10 or 1700.

We could use the expanded form of 167.

$$\begin{array}{rcrcrcr} 167 & = & 100 & + & 60 & + & 7 \\ 167 \times 8 & = & 100 & + & 60 & + & 7 \\ & & & & & & 8 \\ \cline{3-7} & & 800 & + & 480 & + & 56 \\ & & & & & = & 1336 \end{array}$$

It is easier to add the products in a column.

$$\begin{array}{rr} 167 & \\ 8 & \\ \cline{1-1} 56 & 7 \times 8 \\ 480 & 60 \times 8 \\ 800 & 100 \times 8 \\ \cline{1-1} 1336 & \end{array}$$

Multiply 629 × 9.
Do you think 3661 is the product? Why?

IN ACTION

Multiply. Show the products in a column.
Be sure that you estimate before you calculate.

a) 171 × 7 b) 129 × 6 c) 134 × 5 d) 142 × 8 e) 158 × 4 f) 115 × 3
g) 139 × 3 h) 188 × 7 i) 191 × 6 j) 199 × 9 k) 189 × 8 l) 147 × 7
m) 119 × 9 n) 151 × 6 o) 165 × 4 p) 123 × 8 q) 169 × 5 r) 176 × 9

EXPLORE

Multiplication / A 3-Digit Factor and a 1-Digit Factor

Multiply 489 by 8.

Estimate : 500 × 8 = 4000

Products in Columns	Short Form
489	489
8	8
72	3912
640	
3200	
3912	

Think	Record
72	2
64, 71	1
32, 39	39

The short form is efficient if you remember the regrouping.

IN ACTION

1. Multiply. Estimate, then use the short form.

   a) 369 × 4 b) 251 × 6 c) 372 × 7 d) 491 × 3 e) 234 × 8 f) 184 × 5

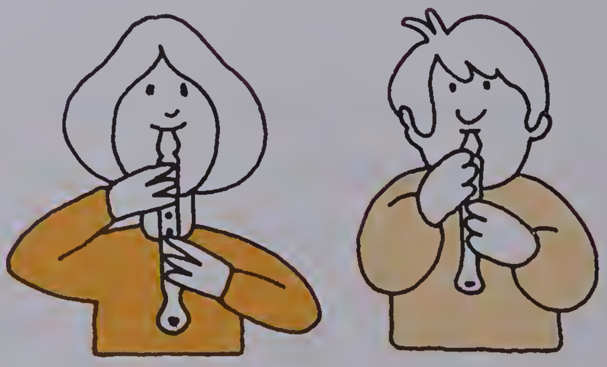
   g) 199 × 9 h) 358 × 6 i) 419 × 5 j) 379 × 4 k) 219 × 6 l) 731 × 3

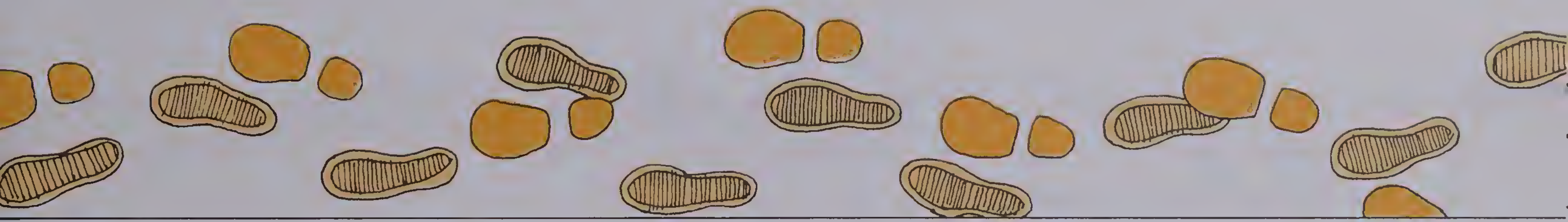
   m) 582 × 5 n) 657 × 8 o) 837 × 7 p) 519 × 9 q) 871 × 7 r) 648 × 8

2. About 235 children went to the music festival from each of 7 schools. About how many children went to the festival?

3. About 675 cattle graze on each of 9 western ranches. About how many cattle are there altogether?

4. If a bicycle wheel turns 139 times each minute, how many turns does it make in 8 minutes?





Retrace Your Steps

Multiply 147 by 8.

Since 147 is about 150, the product is about 150 × 8 or 1200.

Here are 3 ways of calculating the product.

(1)

We can use the expanded form.

$$\begin{array}{rrrrrrrr} 147 \times 8 = & 100 & + & 40 & + & 7 \\ & & & & & 8 \\ \hline & 800 & + & 320 & + & 56 \\ & & & & = & 1176 \end{array}$$

(2)

We can show the products in a column.

$$\begin{array}{rl} 147 & \\ 8 & \\ \hline 56 & \quad 7 \times 8 \\ 320 & \quad 40 \times 8 \\ 800 & \quad 100 \times 8 \\ \hline 1176 & \end{array}$$

(3)

We can use the short form.

$$\begin{array}{r} 147 \\ 8 \\ \hline 1176 \end{array}$$

Think	Record
56	6
32, 37	7
8, 11	11

IN ACTION

Multiply. Use the method indicated.

Expanded Form

1. a) 186 by 7
   b) 235 by 6
   c) 348 by 4
   d) 417 by 3
   e) 563 by 8

Columns

2. a) 219 by 4
   b) 476 by 2
   c) 387 by 8
   d) 615 by 9
   e) 724 by 7

Short Form

3. a) 538 by 3
   b) 417 by 5
   c) 654 by 8
   d) 765 by 7
   e) 849 by 6

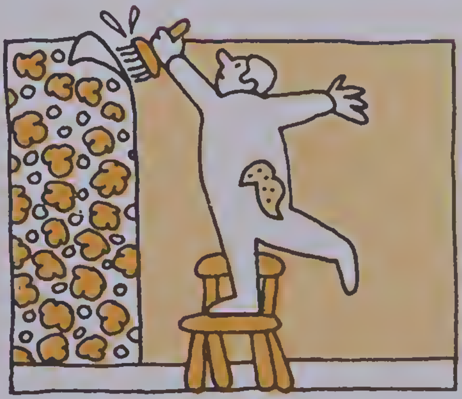
4. Multiply. Use any method.

a) $\begin{array}{r} 248 \\ 9 \\ \hline \end{array}$ b) $\begin{array}{r} 376 \\ 4 \\ \hline \end{array}$

c) $\begin{array}{r} 819 \\ 8 \\ \hline \end{array}$ d) $\begin{array}{r} 945 \\ 4 \\ \hline \end{array}$

5. About 250 cars passed the corner each hour. About how many cars passed the corner in 9 hours?

6. A wallpaper design has 186 flowers in each panel. How many flowers are there in 8 panels?



EXPLORE

Long Division

Divide 132 by 8.

8) 132		How many eights in 132?
80	10	There are at least 10, since 10 × 8 = 80
52		How many eights in 52?
48	6	
4	16	132 ÷ 8 is 16 remainder 4, or 16R4

Estimate carefully and obtain the answer quickly.

Try 857 ÷ 6.

6) 857		How many sixes in 857?
600	100	There are at least 100, since 100 × 6 = 600
257		How many sixes in 257?
?	?	There are at least 40, since 40 × 6 = 240
17		
?	?	
5		857 ÷ 6 = ? R5

IN ACTION

1. What is your first estimate?

Division	First estimate	Division	First estimate
379 ÷ 5	60 × 5 = 300	487 ÷ 7	
537 ÷ 4		965 ÷ 8	
804 ÷ 6		856 ÷ 6	
762 ÷ 9		884 ÷ 4	

2. Find the answers.
   a) 98 ÷ 5 b) 124 ÷ 7 c) 156 ÷ 8 d) 145 ÷ 4 e) 178 ÷ 6 f) 194 ÷ 3
   g) 197 ÷ 8 h) 232 ÷ 9 i) 279 ÷ 6 j) 341 ÷ 6 k) 374 ÷ 7 l) 403 ÷ 9

3. Divide.
   a) $4\overline{)253}$ b) $5\overline{)635}$ c) $6\overline{)728}$ d) $8\overline{)956}$ e) $9\overline{)927}$ f) $6\overline{)437}$
   g) $3\overline{)472}$ h) $7\overline{)929}$ i) $8\overline{)479}$ j) $9\overline{)650}$ k) $6\overline{)943}$ l) $5\overline{)649}$

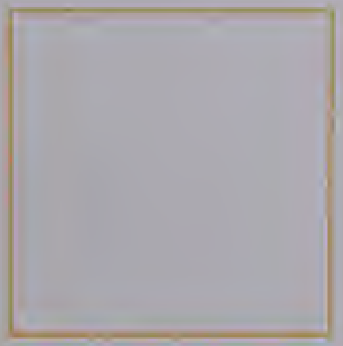
4. Find the answers.
   a) 475 ÷ 3 b) 825 ÷ 6 c) 740 ÷ 8 d) 275 ÷ 4 e) 981 ÷ 9 f) 871 ÷ 8
   g) 751 ÷ 4 h) 940 ÷ 6 i) 680 ÷ 5 j) 947 ÷ 8 k) 837 ÷ 7 l) 986 ÷ 3

5. Divide.
   a) 653 by 2 b) 794 by 3 c) 547 by 5 d) 623 by 4 e) 758 by 8
   f) 974 by 6 g) 893 by 7 h) 781 by 9 i) 754 by 6 j) 927 by 4

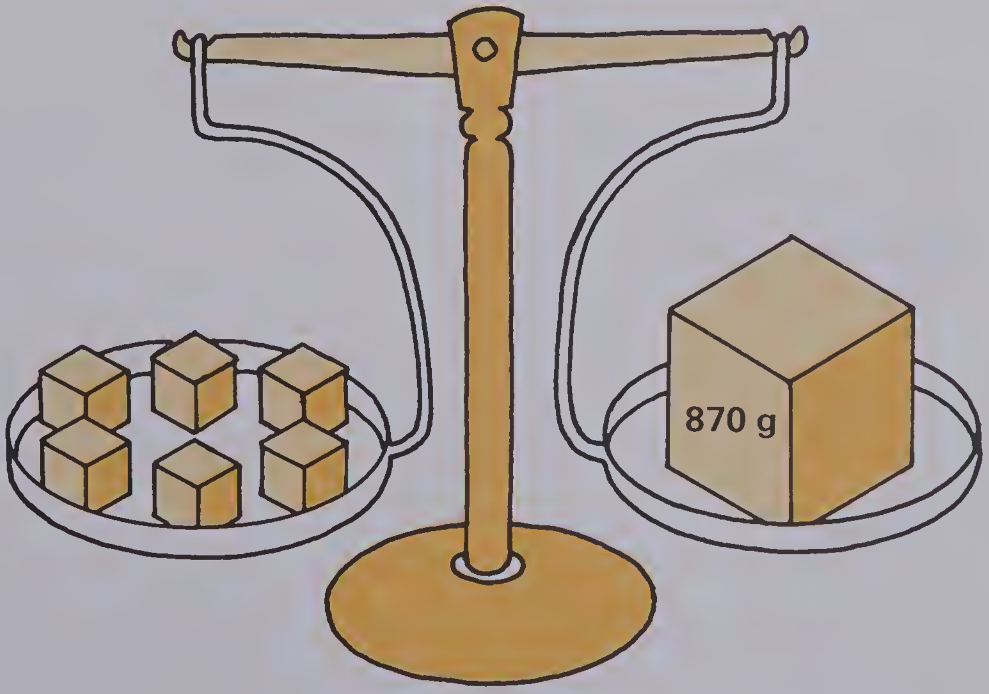
6. 152 hockey players play in 8 equal groups.
   How many players are in each group?

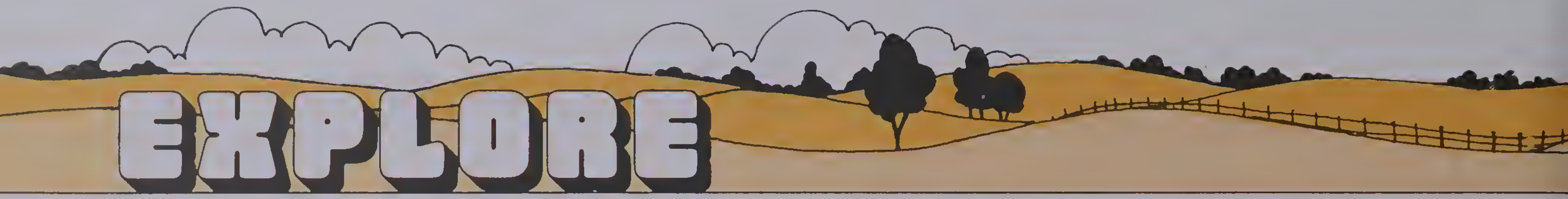
7. What is the mass
   of each box?

8. The perimeter is 560 cm.
   What is the length
   of each side?



square





Long Division

In a division question, the number we divide by
is called the **divisor**.

The answer is called the **quotient**.

How many sevens in 133?

divisor

$$\begin{array}{r|r} 7\overline{)133} & \\ 70 & 10 \\ \hline 63 & \\ 63 & 9 \\ \hline 0 & 19 \end{array}$$

The quotient is 19.

To help you divide,
think about multiplying the divisor by a multiple of 10.

Divide 378 by 9.

$$\begin{array}{r|r} 9\overline{)378} & \\ 360 & 40 \\ \hline 18 & \\ 18 & 2 \\ \hline 0 & 42 \end{array}$$

The quotient is 42.

Divide 974 by 6.

$$\begin{array}{r|r} 6\overline{)974} & \\ 600 & 100 \\ \hline 374 & \\ 300 & 50 \\ \hline 74 & \\ 60 & 10 \\ \hline 14 & \\ 12 & 2 \\ \hline 2 & 162 \end{array}$$

The quotient is 162.

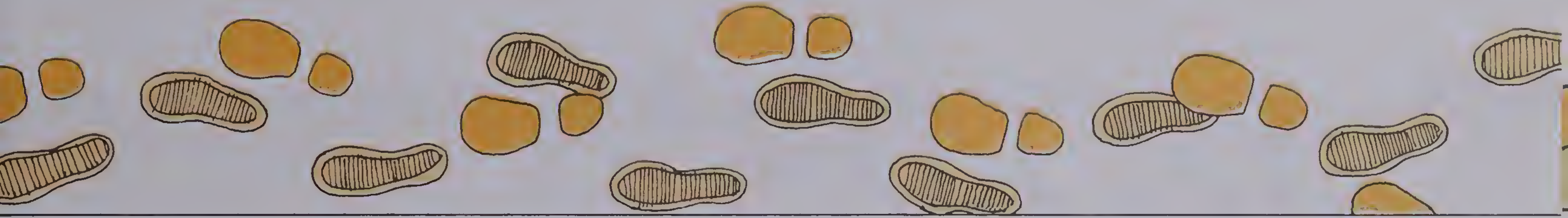
The remainder is 2.

1. Divide.

a) 476 by 4 b) 587 by 6 c) 643 by 5 d) 897 by 7 e) 364 by 8
f) 981 by 9 g) 842 by 4 h) 954 by 7 i) 735 by 6 j) 879 by 7

2. Complete.

a) $3\overline{)435}$ b) $5\overline{)725}$ c) $7\overline{)814}$ d) $8\overline{)923}$ e) $6\overline{)743}$ f) $7\overline{)330}$
g) $4\overline{)827}$ h) $9\overline{)649}$ i) $8\overline{)901}$ j) $9\overline{)989}$ k) $5\overline{)899}$ l) $6\overline{)492}$



Retrace Your Steps

Division tells how many times one number is contained in another number.

18 ÷ 3 = 6 There are 6 threes in 18.

16 ÷ 5 = 3R1 There are 3 fives in 16 and a remainder 1.

Divide 884 by 7.

$7\overline{)884}$		How many sevens in 884?
700	100	There are at least 100, since 100 × 7 = 700
184		How many sevens in 184?
140	20	
44		
42	6	
2	126	884 ÷ 7 = 126R2

IN ACTION

1. Divide.

a) $7\overline{)497}$ b) $4\overline{)380}$ c) $5\overline{)395}$ d) $6\overline{)750}$ e) $8\overline{)864}$ f) $5\overline{)408}$

g) $3\overline{)342}$ h) $9\overline{)189}$ i) $6\overline{)630}$ j) $9\overline{)981}$ k) $7\overline{)749}$ l) $8\overline{)915}$

2. Divide.

a) 650 by 5 b) 397 by 3 c) 467 by 4 d) 786 by 7 e) 984 by 9

f) 287 by 3 g) 567 by 4 h) 683 by 5 i) 876 by 7 j) 894 by 8

3. Find the quotients.

a) 493 ÷ 7 b) 487 ÷ 4 c) 396 ÷ 5 d) 753 ÷ 6 e) 825 ÷ 8 f) 481 ÷ 3

g) 939 ÷ 9 h) 821 ÷ 7 i) 689 ÷ 7 j) 821 ÷ 9 k) 793 ÷ 7 l) 553 ÷ 5

EXPLORE

Multiplication / Each Factor a Multiple of 10

Multiply 60 × 70.
Since 6 × 7 = 42,
then 60 × 70 = 4200

How many zeros are in the 2 factors?
How many zeros are in the product?

IN ACTION

1. Complete.

a) 3 × 4 = ?
30 × 40 = ?

b) 2 × 5 = ?
20 × 50 = ?

c) 4 × 6 = ?
40 × 60 = ?

d) 5 × 6 = ?
50 × 60 = ?

e) 9 × 7 = ?
90 × 70 = ?

f) 4 × 7 = ?
40 × 70 = ?

g) 5 × 8 = ?
50 × 80 = ?

h) 6 × 9 = ?
60 × 90 = ?

2. Find the products.

a) 20 × 80 b) 30 × 70 c) 60 × 40 d) 50 × 20 e) 80 × 30 f) 40 × 30
g) 70 × 20 h) 80 × 60 i) 90 × 50 j) 80 × 70 k) 90 × 70 l) 90 × 80

3. Write two 2-digit factors for each product.

a) 1200 b) 1400 c) 1600 d) 2400 e) 3600 f) 1800
g) 5400 h) 6300 i) 7200 j) 6400 k) 8100 l) 5600

4. About how many houses are in the town?
There are about 50 streets.
There are about 30 houses on each street.

5. There are about 30 children in each classroom.
There are 20 classrooms in the school.
About how many children are in the school?

EXPLORE

Multiplying by a Multiple of 10

Find 48 × 30.

$$\begin{aligned} 48 \times 30 &= 48 \times (10 \times 3) \\ &= 48 \times 10 \times 3 \\ &= 480 \times 3 \\ &= 1440 \end{aligned}$$

Find 480 × 3 this way:

$$\begin{array}{r} 480 \\ 3 \\ \hline 1440 \end{array}$$

IN ACTION

1. Complete.

a) 37 × 10 = ?
370 × 4 = ?
37 × 40 = ?

b) 56 × 10 = ?
560 × 3 = ?
? × ? = ?

c) ? × ? = ?
? × ? = ?
49 × 80 = 3920

d) ? × ? = ?
? × ? = ?
63 × 50 = ?

e) ? × 10 = ?
? × 4 = ?
78 × 40 = ?

f) ? × ? = ?
850 × 7 = ?
? × ? = ?

g) ? × ? = ?
? × 6 = ?
94 × 60 = ?

h) ? × ? = ?
? × 9 = ?
77 × ? = ?

2. Find the products.

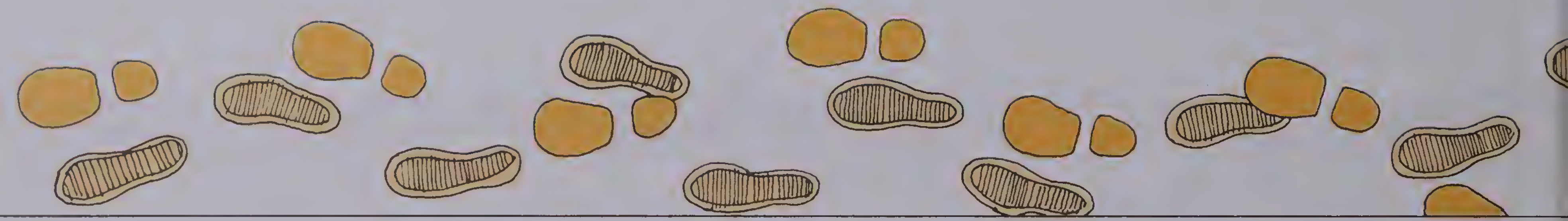
a) 62 × 40 b) 76 × 20 c) 35 × 80 d) 29 × 90 e) 58 × 30 f) 51 × 40
g) 46 × 50 h) 53 × 30 i) 68 × 20 j) 79 × 20 k) 83 × 60 l) 94 × 60

3. Multiply.

a) 74 by 50 b) 87 by 60 c) 93 by 40 d) 49 by 70 e) 88 by 90

4. There are about 70 books on each library shelf. There are 37 shelves. About how many books are on the shelves?

5. There are about 90 cars on each level of the parking garage. There are 12 levels. About how many cars are in the parking garage?



Retrace Your Steps

A multiple of 10
and a 1-digit factor

Find 7×40.
Think $7 \times 4 = 28$
$7 \times 40 = 280$

Each factor
a multiple of 10

Find 70×40.
Think $7 \times 4 = 28$
$7 \times 40 = 280$
$70 \times 40 = 2800$

A multiple of 10
and a 2-digit factor

Find 38×70.
Think $70 = 10 \times 7$
$38 \times 70 = 38 \times (10 \times 7)$
$= 380 \times 7$
$= 2660$

IN ACTION

Complete.

1. a) 6×30
$6 \times 3 = ?$
$6 \times 30 = ?$

b) 8×50
$8 \times 5 = ?$
$8 \times 50 = ?$

c) 4×80
$4 \times 8 = ?$
$4 \times 80 = ?$

d) 9×60
$9 \times 6 = ?$
$9 \times 60 = ?$

e) 8×90
$8 \times 9 = ?$
$8 \times 90 = ?$

2. a) 60×30
$6 \times 3 = ?$
$6 \times 30 = ?$
$60 \times 30 = ?$

b) 40×80
$4 \times 8 = ?$
$4 \times 80 = ?$
$40 \times 80 = ?$

c) 50×70
$5 \times 7 = ?$
$5 \times 70 = ?$
$50 \times 70 = ?$

d) 70×90
$7 \times 9 = ?$
$7 \times 90 = ?$
$70 \times 90 = ?$

3. a) 27×50
$27 \times 50 = 27 \times (10 \times 5)$
$= 270 \times 5$
$= ?$

b) 43×60
$43 \times 60 = 43 \times (10 \times 6)$
$= ? \times 6$
$= ?$

c) 58×80
$58 \times 80 = 58 \times (10 \times 8)$
$= ? \times ?$
$= ?$

d) 36×70
$36 \times 70 = 36 \times (10 \times 7)$
$= ? \times ?$
$= ?$

4. Find the products.
a) 9×50 b) 7×80 c) 6×90 d) 30×50 e) 40×20 f) 70×80
g) 60×90 h) 38×40 i) 41×60 j) 28×50 k) 46×80 l) 55×90

Multiplication / Two 2-Digit Factors

Find 48 × 32.

Since 48 = 40 + 8 and 32 = 30 + 2
we could multiply using the expanded forms.

$$\begin{array}{rr} 48 = & 40 + 8 \\ \underline{32} = & 30 + 2 \\ \hline & 1200 + 240 + 80 + 16 \\ & = 1536 \end{array}$$

It is easier if we remember the regrouping
and record this way.

$$\begin{array}{lr} & 48 \\ & 32 \\ \hline 48 \times 2 & 96 \\ 48 \times 30 & 144 \\ \hline & 1536 \end{array}$$

Think	Record
16	6
8, 9	9
next row	
24	4 one place left
12, 14	14

Quick check: 48 is about 50 and 32 is about 30
50 × 30 = 1500
The answer 1536 is reasonable.

IN ACTION

1. Find the products. Check by estimating.

a) 23 × 12 b) 32 × 14 c) 27 × 15 d) 44 × 16 e) 39 × 18 f) 27 × 17

g) 59 × 19 h) 37 × 28 i) 63 × 41 j) 48 × 21 k) 73 × 52 l) 36 × 45

2. Multiply.

a) 34 by 23 b) 46 by 61 c) 57 by 24 d) 68 by 45 e) 83 by 76

EXPLORE

Multiplication / Two 2-Digit Factors

Find 76 × 43.

$$\begin{array}{lr} & 76 \\ & 43 \\ \hline 76 \times 3 & 228 \\ 76 \times 40 & 304 \\ \hline & 3268 \end{array}$$

Think	Record
18	8
21, 22	22
next row	
24	4 one place left
28, 30	30

Quick check : 76 is about 80 and 43 is about 40

$80 \times 40 = 3200$

The answer 3268 is reasonable.

IN ACTION

1. Find the products. Check by estimating.

a) 79 × 13 b) 47 × 11 c) 69 × 12 d) 71 × 19 e) 42 × 17 f) 19 × 80

g) 21 × 17 h) 53 × 12 i) 68 × 14 j) 82 × 18 k) 48 × 32 l) 67 × 51

2. Multiply.

a) 47 by 64 b) 38 by 29 c) 72 by 37 d) 57 by 43 e) 39 by 19

f) 68 by 35 g) 73 by 48 h) 84 by 56 i) 96 by 70 j) 99 by 88

3. The Apex Company shipped 27 cartons with 12 boxes of ball-point pens in each carton. How many boxes did they ship?

4. There are 15 rooms in the school. Each room has 24 students. How many students attend the school?

5. Through how many minutes will the minute hand of a clock move in 23 hours?

6. The office building has 47 floors. The emergency stairway for each floor has 19 steps. How many steps are there from the basement to the top floor?

Retrace Your Steps

Find 86 × 47.

$$\begin{array}{lr} & 86 \\ & \underline{47} \\ 86 \times 7 & 602 \\ 86 \times 40 & \underline{344} \\ & 4042 \end{array}$$

$$\begin{array}{rcr} \text{Recall } 86 \times 7 & = & 602 \\ 86 \times 40 & = & 3440 \end{array}$$

IN ACTION

1. Multiply.

a) $\begin{array}{r}34\\ \underline{23}\end{array}$ b) $\begin{array}{r}61\\ \underline{42}\end{array}$ c) $\begin{array}{r}54\\ \underline{27}\end{array}$ d) $\begin{array}{r}48\\ \underline{35}\end{array}$ e) $\begin{array}{r}18\\ \underline{54}\end{array}$ f) $\begin{array}{r}73\\ \underline{19}\end{array}$ g) $\begin{array}{r}15\\ \underline{83}\end{array}$ h) $\begin{array}{r}39\\ \underline{66}\end{array}$

i) $\begin{array}{r}75\\ \underline{28}\end{array}$ j) $\begin{array}{r}87\\ \underline{36}\end{array}$ k) $\begin{array}{r}92\\ \underline{44}\end{array}$ l) $\begin{array}{r}78\\ \underline{87}\end{array}$ m) $\begin{array}{r}95\\ \underline{48}\end{array}$ n) $\begin{array}{r}67\\ \underline{59}\end{array}$ o) $\begin{array}{r}98\\ \underline{26}\end{array}$ p) $\begin{array}{r}63\\ \underline{14}\end{array}$

2. Find the products.

a) 62 × 31 b) 47 × 23 c) 55 × 19 d) 88 × 17 e) 94 × 38 f) 69 × 26

g) 78 × 59 h) 87 × 42 i) 93 × 58 j) 97 × 18 k) 75 × 58 l) 35 × 48

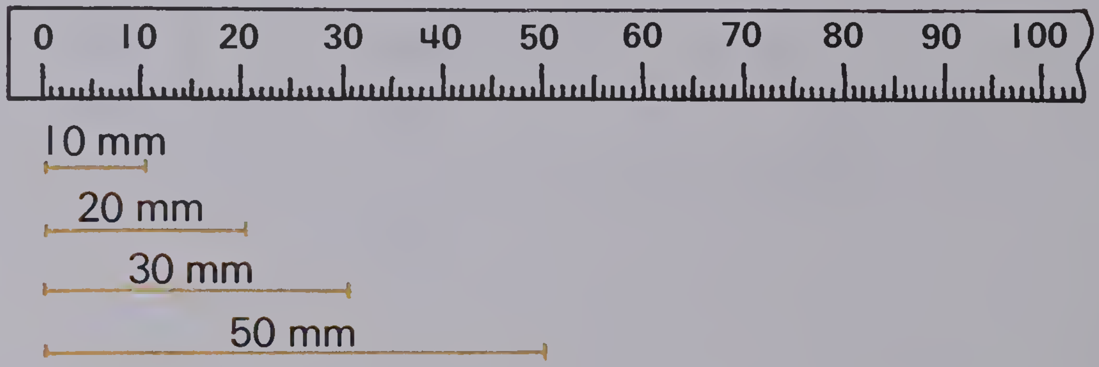
3. There are about 90 streets in the town.
There are about 70 houses on each street.
About how many houses are in the town?

4. There are 20 rulers in each package.
There are 50 packages.
How many rulers are there?

5. Each volume in the set of books costs $35.
There are 26 volumes.
What is the cost of the set of books?

netre mm

A centimetre is divided into 10 millimetres (10 mm).
1 cm = 10 mm


0
10
20
30
40
50
60
70
80
90
100
10 mm
20 mm
30 mm
50 mm

Look at the ruler. Study the length of each line segment. Try to get a good picture of each length.

List objects that have lengths of about 50 mm.

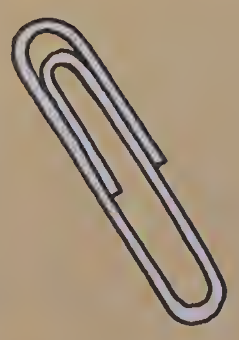
Draw a line segment that you think is about 10 mm long. Measure it. How close did you come?

Do the same thing for 20 mm, 5 mm, and 50 mm.

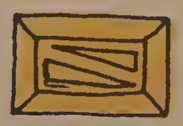
IN ACTION

1. Find the length, in millimetres, of each object.

a)



b)



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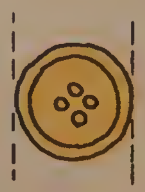
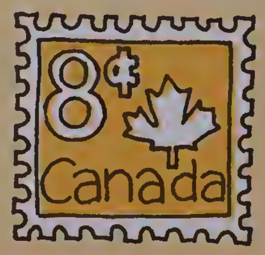
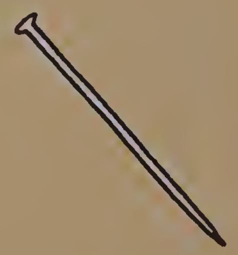


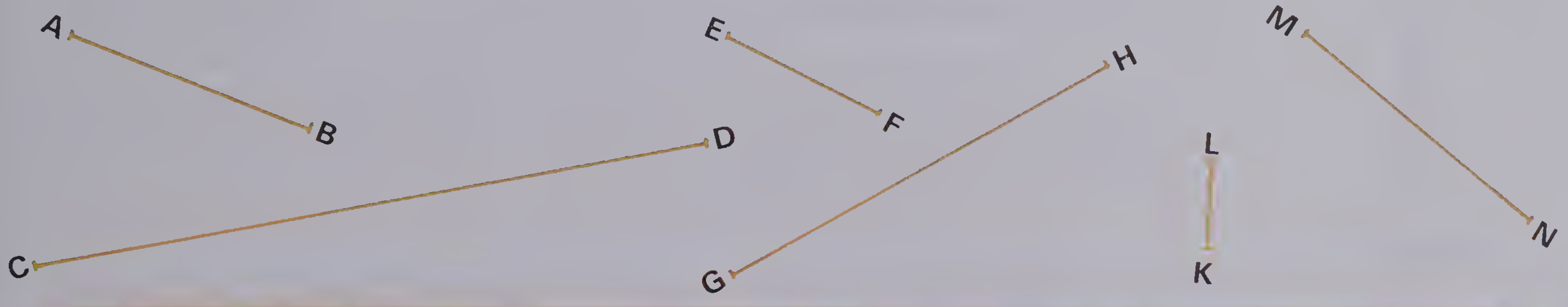
d)



e)

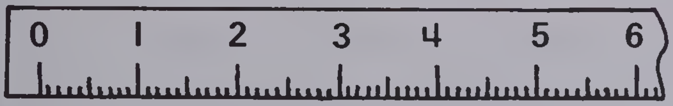


2. Look at a line segment. How long do you think it is?
   Record your estimate, then measure. Complete the chart.



Line segment	Estimated length in millimetres	Measured length in millimetres
AB		
CD		
EF		
GH		
KL		
MN		

3. Look at the ruler. How many millimetres are there in 1 cm?



How many millimetres are there in 2 cm?

How many millimetres are there in each of these?

a) 6 cm b) 9 cm c) 13 cm d) 15 cm e) 35 cm f) 95 cm g) 20 cm h) 71 cm

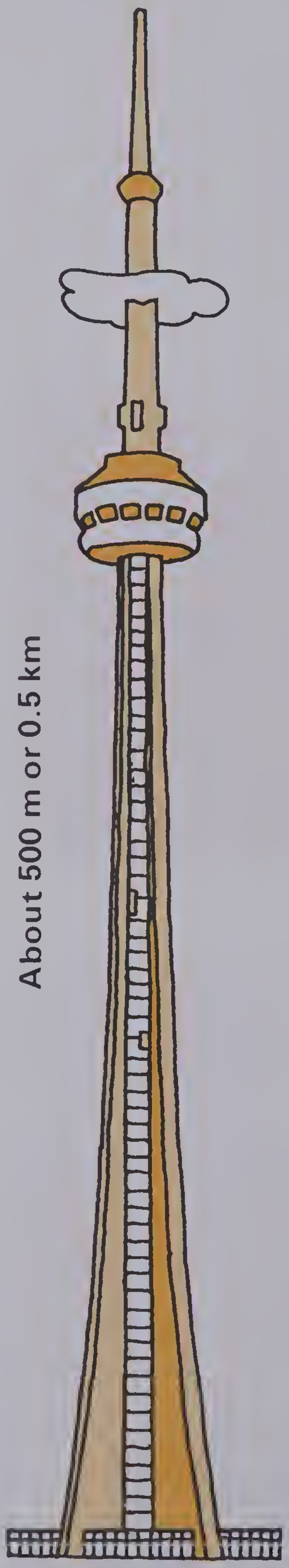
4. How many millimetres are there in 1 m?

5. Estimating lengths. Turn your ruler over so that you don't use the scale.
   Draw a line segment that you think is 30 mm long.
   Now measure the line segment. Draw a line below it that is 30 mm long.

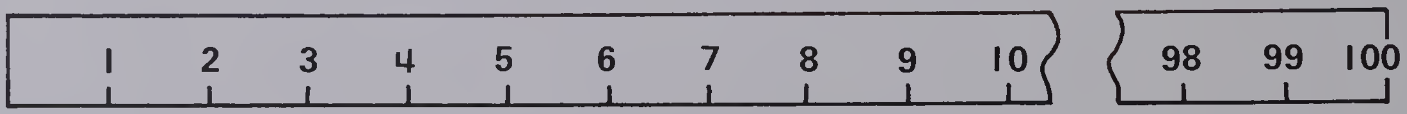
   Repeat for a) 10 mm b) 70 mm c) 60 mm d) 80 mm e) 50 mm f) 100 mm g) 40 mm

EXPLORE

The Kilometre km


About 500 m or 0.5 km

Look at a metre stick.
It is marked in centimetres.

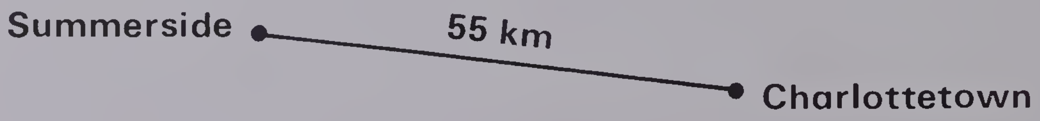

1
2
3
4
5
6
7
8
9
10
98
99
100

100 cm = 1 m

1000 metre sticks placed end-to-end make 1 kilometre (km).

1000 m = 1 km

We use kilometres to measure long distances.


Summerside
55 km
Charlottetown

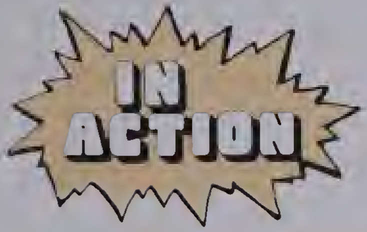
It is important for you to get a good concept of 1 km.
Here are some ideas to help you.

If you walk 3 times around a city block,
you walk about 1 km.

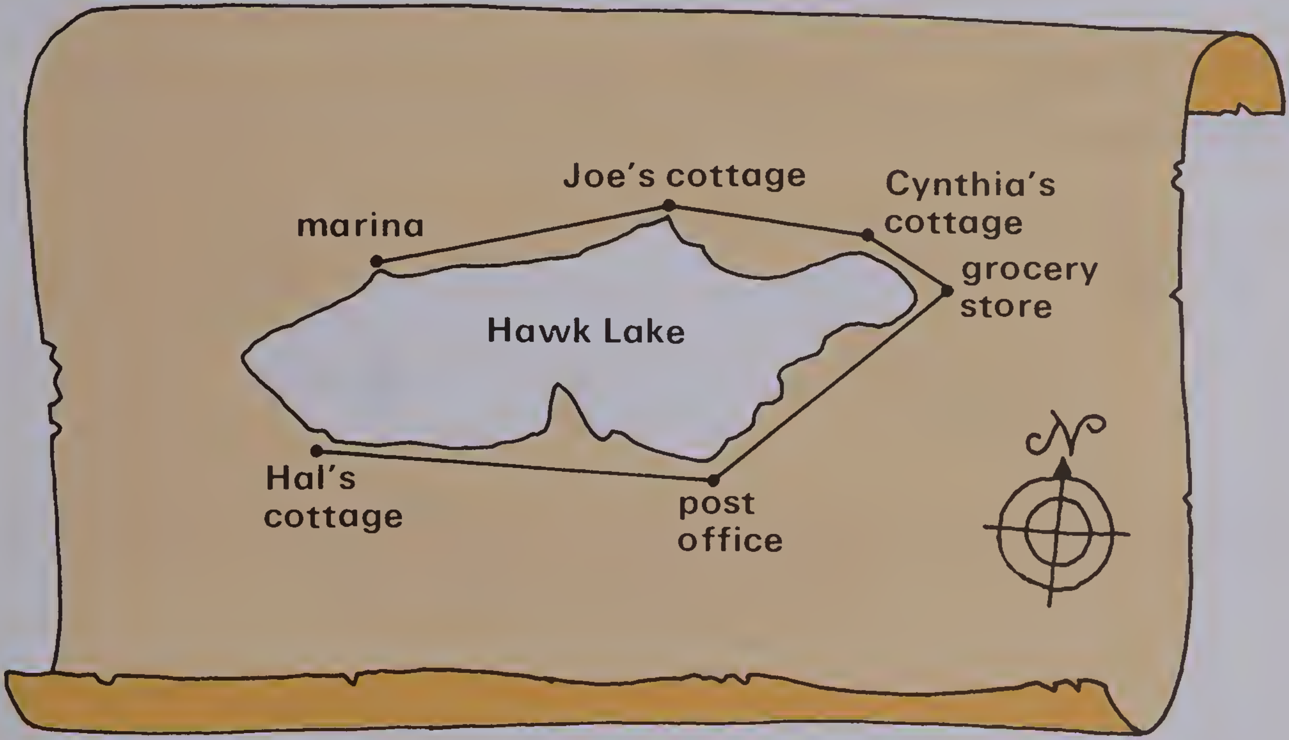
Cut a piece of string 100 m long.
Stretch it out in your schoolyard.
10 times that length is about 1 km.

Measure the time it takes you to walk
the length of your string (100 m).
How long would it take you to walk 1 km?
It takes about 12 minutes to walk 1 km.

If you go to the top of the CN tower and
come down again, you will travel about 1 km.



On this map, 1 cm = 1 km


Joe's cottage
Cynthia's cottage
marina
grocery store
Hawk Lake
Hal's cottage
post office
N

1. a) How many kilometres is it from Joe's cottage to Cynthia's cottage?

   b) Cynthia rode her bicycle from her cottage to the grocery store and then home. How far did she ride?

   c) Joe rode his bike to the post office, then home. How far did he ride?

   d) Hal rode to the grocery store for a litre of milk. How far did he ride?

   e) About how long is Hawk Lake?

2. Complete.

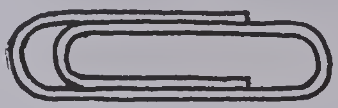
a) 7 km = ? m	b) 2 km = ? m	c) 1000 m = ? km	d) 3000 m = ? km
e) 10 km = ? m	f) 5 km = ? m	g) 5000 m = ? km	h) 2000 m = ? km

EXPLORE

mm cm m km

A centimetre is divided into 10 mm.
We write mm for millimetre.

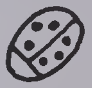
1 cm = 10 mm



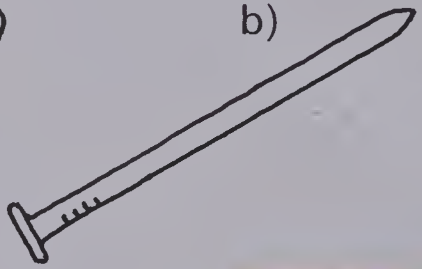
The wire in a paper clip is about 1 mm thick.

Estimate, then measure the length of each object in millimetres.

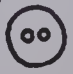
a)



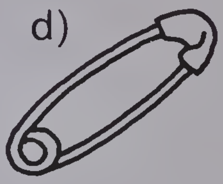
b)

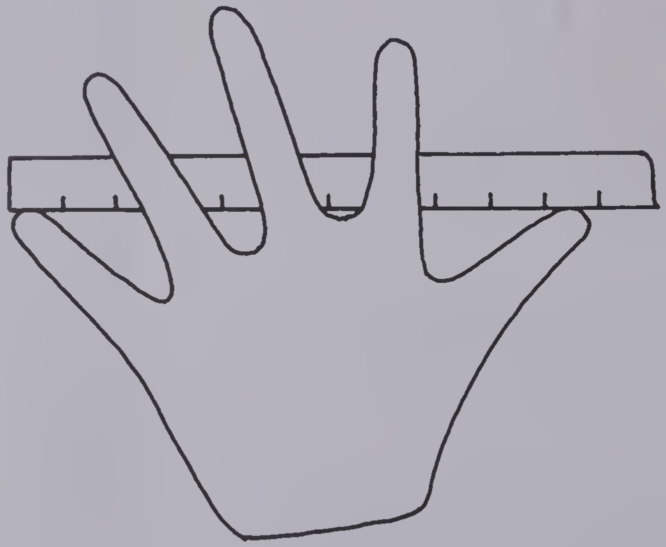


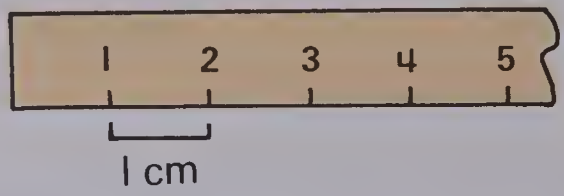
c)



d)







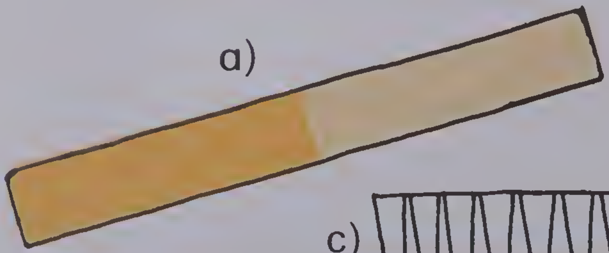
Your little finger is about 1 cm wide.

We write cm for centimetre.

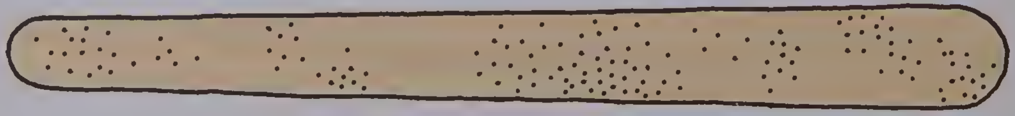
You should know the length of your hand span in centimetres.

Estimate, then measure the length of each object in centimetres.

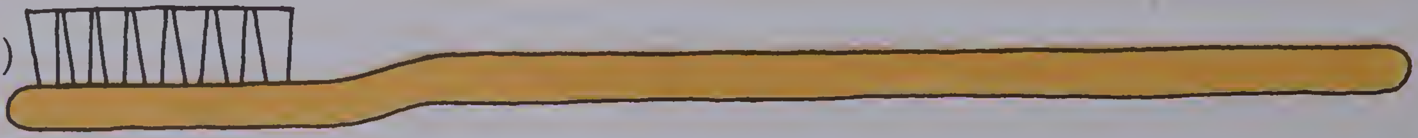
a)

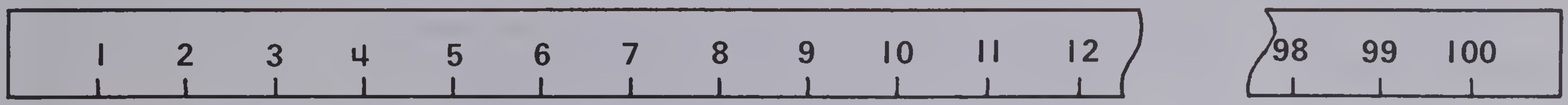


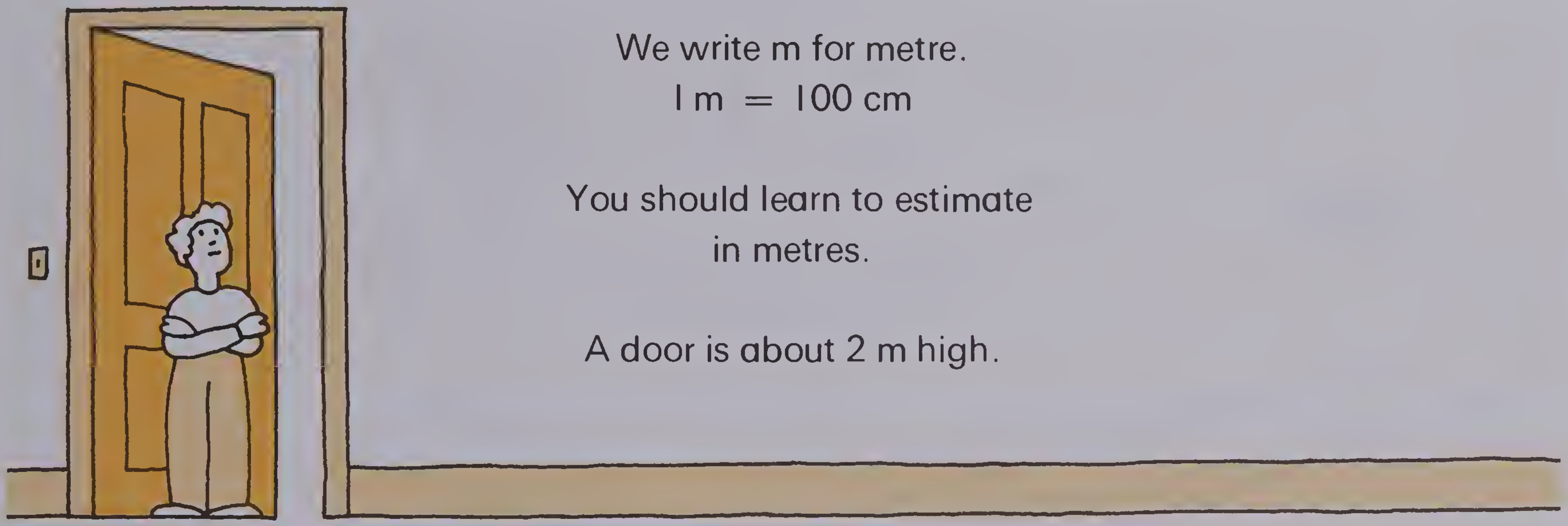
b)



c)







We write m for metre.
1 m = 100 cm

You should learn to estimate
in metres.

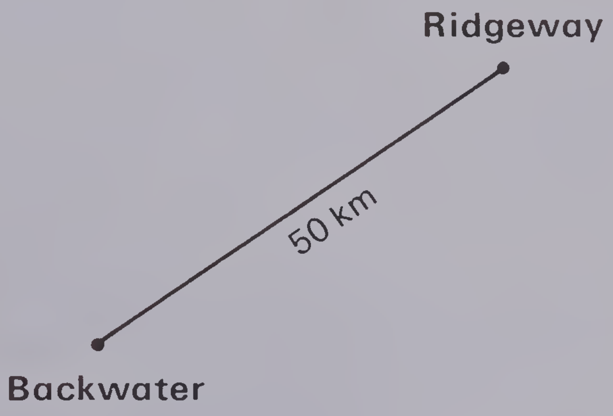
A door is about 2 m high.

A kilometre is 1000 m.
We write km for kilometre.
1000 m = 1 km

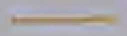
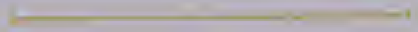
We use kilometres to measure long distances.

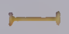
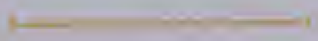
The distance across Canada, from St. John's, Nfld., to Victoria, B.C., is about 7600 km.

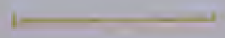
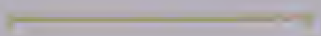
It takes about 12 minutes to walk 1 km.



Distances on maps are given to scale.

If this line represents 1 km,  what does this line represent? 

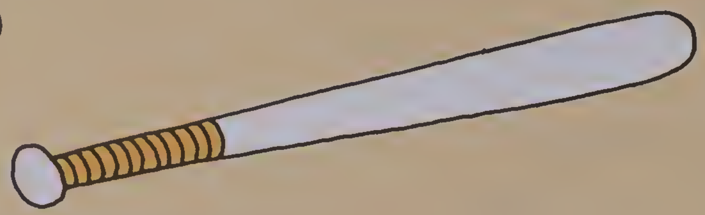
If this line represents 1 km,  what does this line represent? 

If this line represents 1 km,  what does this line represent? 

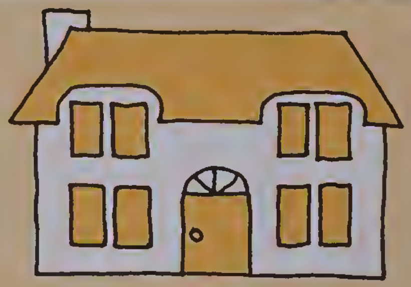
IN ACTION

1. What unit (millimetre, centimetre, metre, kilometre) would you use to measure each of these?

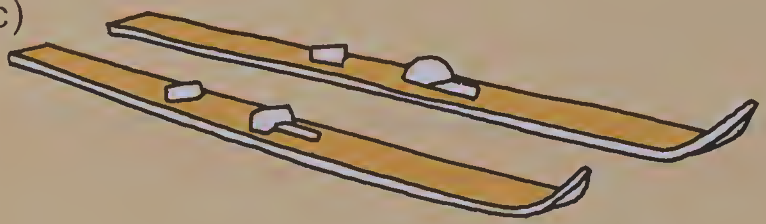
a)



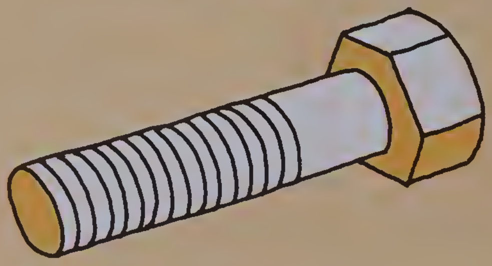
b)



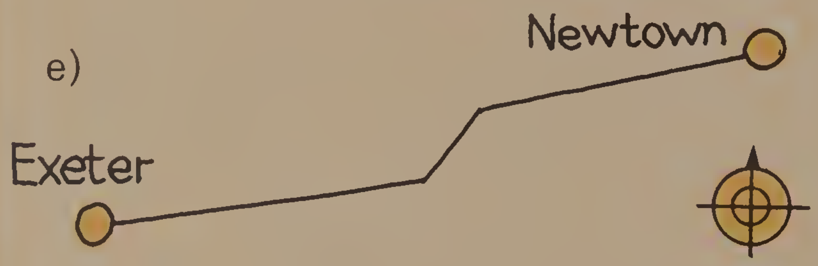
c)



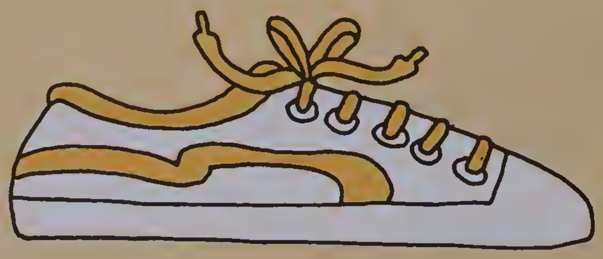
d)



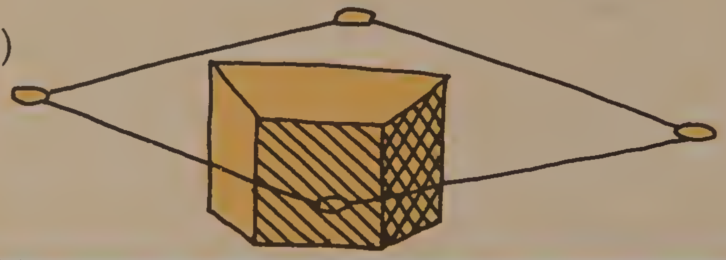
e)



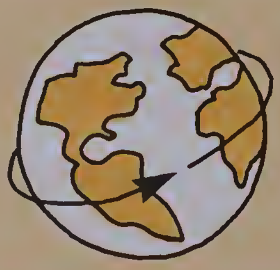
f)



g)



h)



2. Complete.

a) 2 cm = ? mm
b) 2 m = ? cm
c) 1 km = ? m
d) 50 mm = ? cm
e) 1000 m = ? km
f) 5000 m = ? cm
g) 300 cm = ? m
h) 5 cm = ? mm
i) 7 m = ? cm
j) 1000 cm = ? m
k) 20 mm = ? cm
l) 9 km = ? m

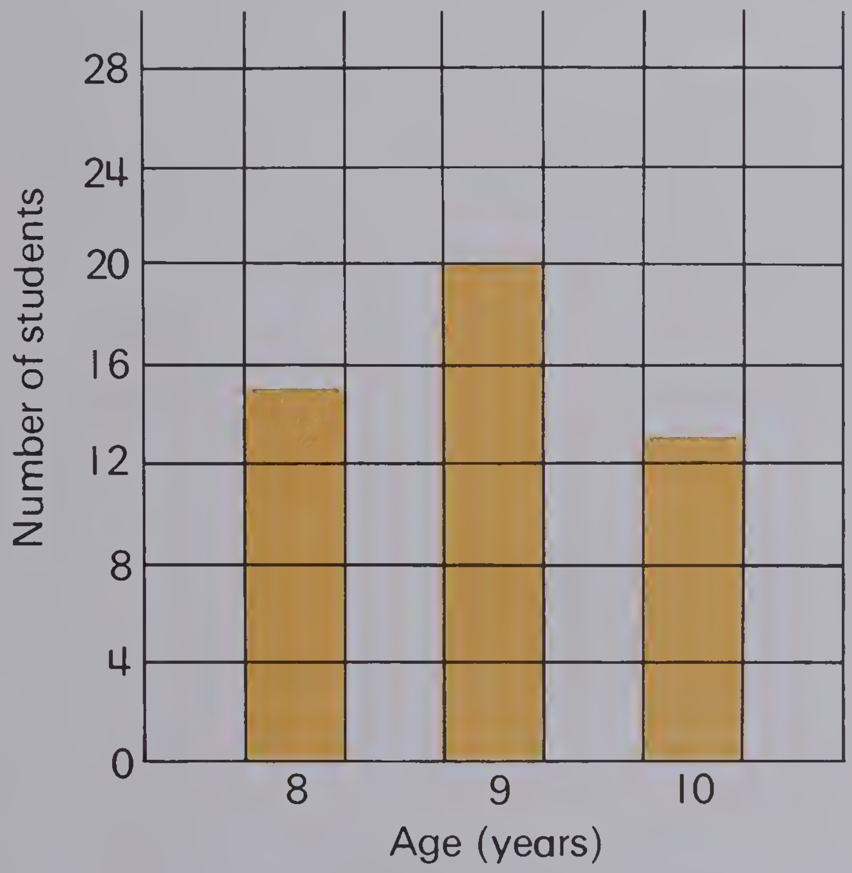
EXPLORE

Graphing

Joe collected this information
about the ages of the Grade 4 students
in his school.

Age in years	8	9	10
Number of students	15	20	13

He used the information
to draw this graph.

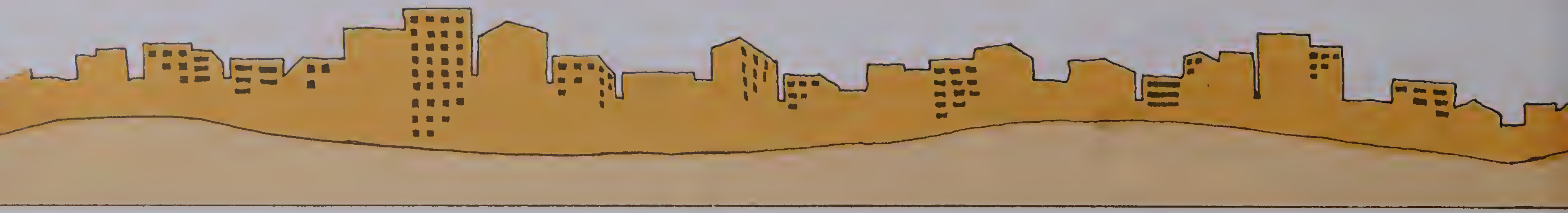


Look at the graph to answer the questions Joe asked.

How many students does each square represent?

How many students are 8 years old?   9 years old?   10 years old?

How many students are in Grade 4 in Joe's school?

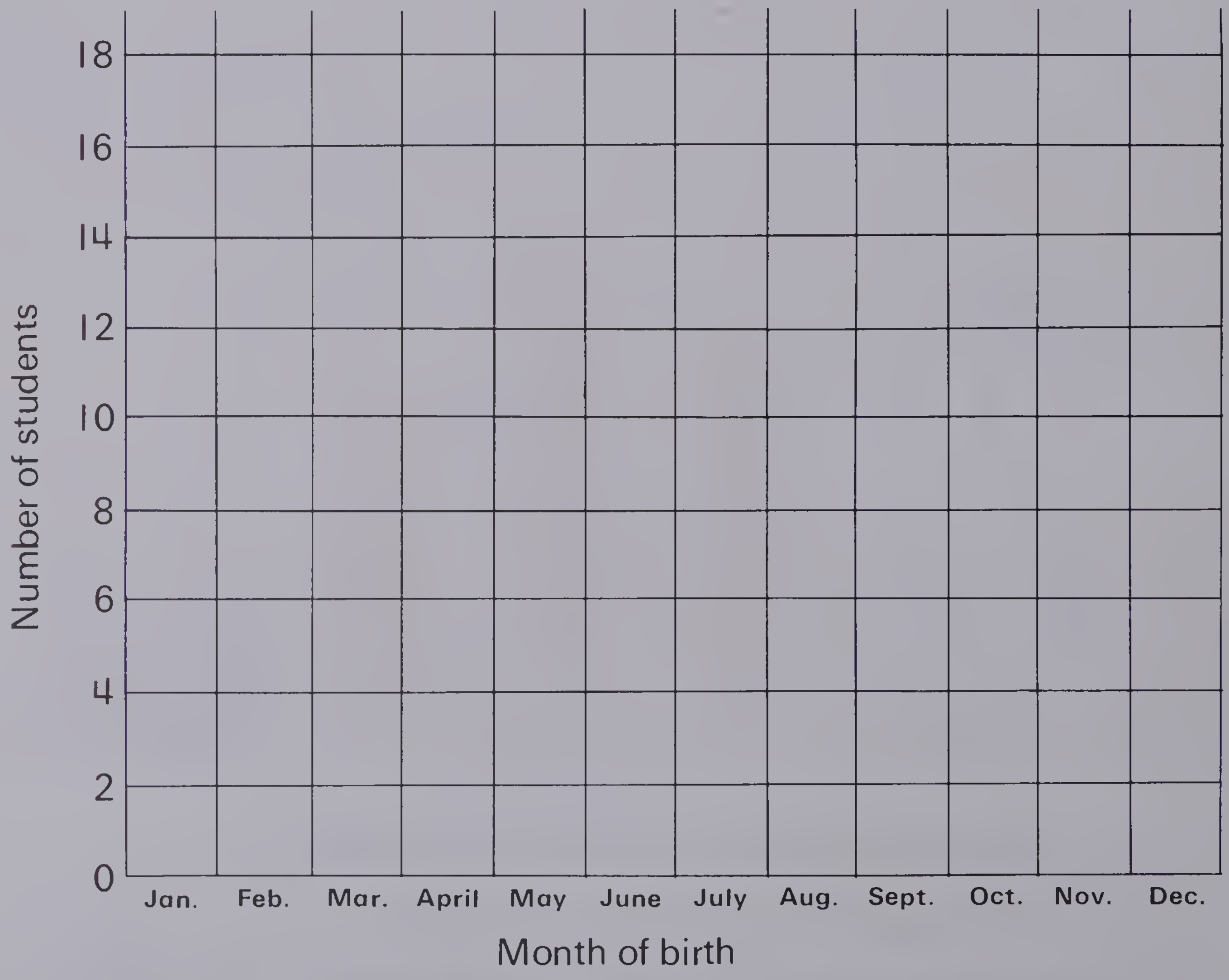


IN ACTION

1. Maria collected this information.

Month of birth	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Number of students	13	14	5	11	16	17	7	13	12	9	14	3

a) Use graph paper and Maria's information to help you build a graph. It has been started for you.



b) Write 6 facts you can discover by examining your graph.

c) How many students does each square represent?

2. Collect information about months of birth from members of your class.

Make a table like Maria's.

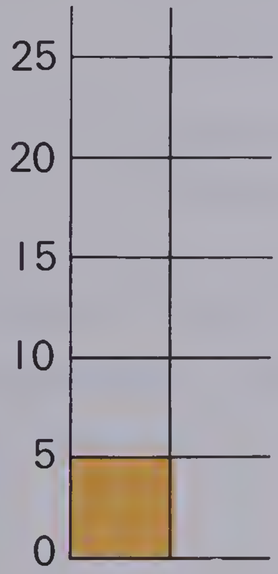
Draw a graph like the one in Question 1. Let each square represent 2 people.

3. Use graph paper to answer these questions.

a) Each square represents 5 robins.

How many robins does the coloured bar represent?

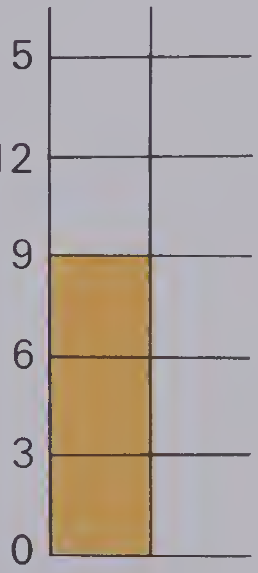
Draw a bar to represent 20 robins.



b) Each square represents 3 roses.

How many roses does the coloured bar represent?

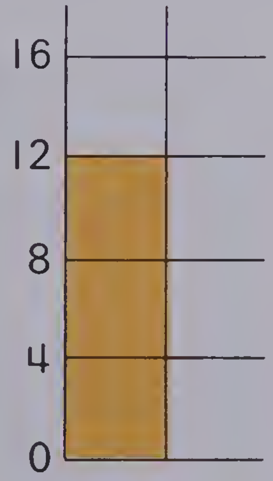
Draw a bar to represent 15 roses.



c) Each square represents 4 bicycles.

How many bicycles does the coloured bar represent?

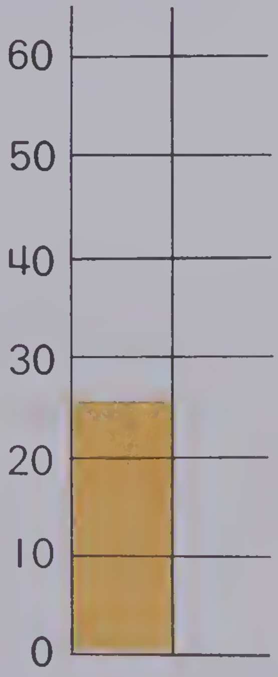
Draw a bar to represent 10 bicycles.

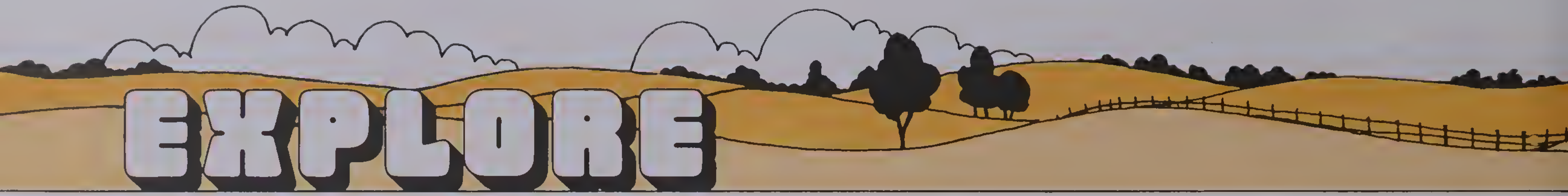


d) Each square represents 10 people.

How many people does the coloured bar represent?

Draw a bar to represent 55 people.





EXPLORE

Patterns

Examine the pattern.

1, 2 ÷ 2 = ?, 3, 4 ÷ 2 = ?, 5, 6 ÷ 2 = ?, 7, . . .

Copy and continue the pattern for 5 more entries.

Since 0 ÷ 2 = 0, 0 is **divisible by 2.**
Even numbers are divisible by 2.
List the first 10 even numbers.

An **odd number** is not divisible by 2.
List the first 10 odd numbers.

Examine these numbers: $\underline{7}$, 3$\underline{4}$, 12$\underline{5}$, 789$\underline{0}$, 5$\underline{8}$, 7$\underline{3}$

A number is even. What could the ones digit be?
A number is odd. What could the ones digit be?

IN ACTION

1. Sort the numbers into 2 sets:
   a) even numbers b) odd numbers

47, 86, 5028, 9641, 33, 43, 7700
1 + 1, 3 + 1, 4 + 1, 5 + 2, 6 + 2, 7 × 7
8 × 6, 14 ÷ 7, 38 − 1, 27 ÷ 3, 42 ÷ 6

2. List the even numbers
   - a) between 30 and 50
   - b) between 90 and 100
   - c) greater than 12 and less than 22
   - d) less than 20 and divisible by 4

3. List the odd numbers
   - a) between 40 and 70
   - b) between 80 and 100
   - c) greater than 17 and less than 37
   - d) less than 24 and divisible by 3

EXPLORE

Patterns

Start with an odd number.
How do you find the next even number?
Give 5 examples.

Start with an even number.
How do you find the next odd number?
Give 5 examples.

Complete the exploration.

odd odd ? 3 + 5 = ?	odd even ? ? + ? = ?	even odd ? ? + ? = ?	even even ? ? + ? = ?

Write your own exploration of odd and even numbers for
a) subtraction b) multiplication c) division

IN ACTION

Sort into 2 sets:
a) even numbers b) odd numbers

39, 48, 1069, 3888, 7491

3 + 7, 4 × 8, 12 ÷ 2, 18 − 17, 19 − 16

36 ÷ 6, 54 ÷ 9, 63 ÷ 7, 9 × 9, 8 × 8

22 − 20, 50 ÷ 5, 10 × 10, 30 × 20, 19 × 10

Unit 3, Check I

Check your understanding of place value, addition, and subtraction.
If you need more practice, do Practice I on page 231.

1. Write the meanings.
   a) 5034 b) 1906 c) 285.7
   d) 491.03 e) 9632.71 f) 4850.93

2. Write the expanded forms.
   a) 2547 b) 6370 c) 128.4
   d) 319.25 e) 3564.87 f) 8149.62

3. Order from greatest to least.

3728 885.1 518.46 1647.04 7953 373.5 275.28
6102.37 9617 709.3 924.69 2856.90

4. Add.

a)	b)	c)	d)	e)	f)	g)
1839	4975	5178	2529	4768	3596	1534
2467	3049	1973	2678	2648	3596	3489

5. Subtract.

a)	b)	c)	d)	e)	f)	g)
6432	7234	9135	8463	7257	5538	6172
1449	2267	5658	6579	5698	2579	3895

6. Add.

a)	b)	c)	d)	e)
827.04	458.46	617.91	923.71	670.52
763.59	454.09	416.56	250.59	646.80

7. Subtract.

a)	b)	c)	d)	e)
817.63	817.82	739.51	687.26	635.18
254.68	496.13	186.82	580.87	297.47

1. a) 5 thousands, 0 hundreds, 3 tens, and 4 b) 1 thousand, 9 hundreds, 0 tens, and 6 c) 2 hundreds, 8 tens, 5 ones, and 7 tenths
   d) 4 hundreds, 9 tens, 1 one, 0 tenths, and 3 hundredths e) 9 thousands, 6 hundreds, 3 tens, 2 ones, 7 tenths, and 1 hundredth f) 4 thousands, 8 hundreds, 5 tens, 0 ones, 9 tenths, and 3 hundredths
2. a) 2000 + 500 + 40 + 7 b) 6000 + 300 + 70 + 0
   c) 100 + 20 + 8 + 0.4 d) 300 + 10 + 9 + 0.2 + 0.05
   e) 3000 + 500 + 60 + 4 + 0.8 + 0.07 f) 8000 + 100 + 40 + 9 + 0.6 + 0.02
3. 9617, 7953, 6102.37, 3728, 2856.90, 1647.04, 924.69, 885.1, 709.3, 518.46, 373.5, 275.28
4. a) 4306 b) 8024 c) 7151 d) 5207 e) 7416 f) 7192 g) 5023
5. a) 4983 b) 4967 c) 3477 d) 1884 e) 1559 f) 2959 g) 2277
6. a) 1590.63 b) 912.55 c) 1034.47 d) 1174.30 e) 1317.32
7. a) 562.95 b) 321.69 c) 552.69 d) 106.39 e) 337.71

Practice I

1. Regroup. Exchange 10 for 1 from each place to the one on the left.
   a) 3000 + 1600 + 180 + 12 = 4000 + 700 + 90 + ?
   b) 1000 + 1400 + 170 + 11 + 1.6 = ?
   c) 8000 + 1200 + 140 + 17 + 1.4 + 0.12 = ?
2. Regroup. Exchange 1 for 10 from each place to the one on the right.
   a) 7000 + 400 + 60 + 1 = 6000 + 1300 + 150 + ?
   b) 5000 + 200 + 90 + 1 + 0.4 = ?
   c) 8000 + 700 + 30 + 4 + 0.9 + 0.09 = ?
3. Add this way.

3428
2596

14
110
900
5000

6024

a)	b)	c)	d)	e)
2895	3637	3829	3675	1698
5138	1587	5276	4469	2387

f)	g)	h)	i)	j)
3894	4674	6378	2951	1678
3407	1659	2798	4959	7625

4. Subtract this way.

4754 = 3000 + 1600 + 140 + 14
2768 = 2000 + 700 + 60 + 8

1986 = 1000 + 900 + 80 + 6

a)	b)	c)	d)	e)	f)	g)	h)
6235	8132	7465	5748	5387	6125	7331	7240
4837	3589	5498	2879	4689	3749	2476	4598

5. Add.

a)	b)	c)	d)	e)	f)
381.79 ↑	418.52	375.69	480.41	375.82	268.59
524.56	463.92	541.78	365.91	306.79	634.76

6. Subtract.

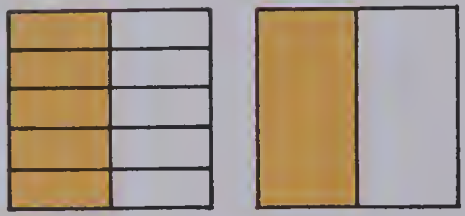
a)	b)	c)	d)	e)	f)
924.76 ↓	596.80	987.24	931.36	812.61	819.15
376.38	147.16	761.65	258.92	243.69	439.23

Unit 3, Check 2

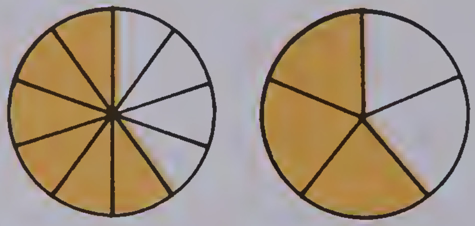
Check your understanding of fractions and measurement.

1. Write the equivalent fractions.

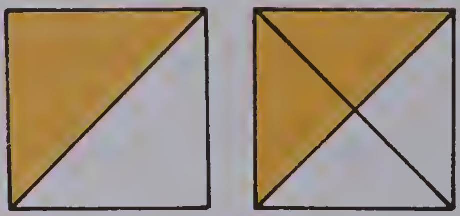
a)



b)

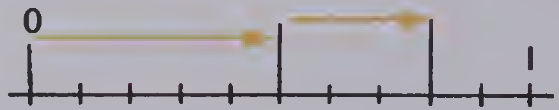


c)

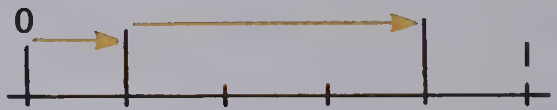


2. Add the fractions.

a)



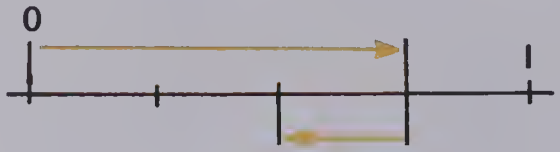
b)



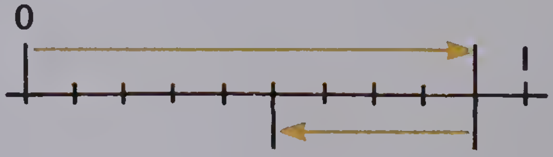
c) $\frac{3}{10} + \frac{4}{10} = ?$ d) $\frac{1}{4} + \frac{3}{4} = ?$ e) $\frac{2}{10} + \frac{7}{10} = ?$ f) $\frac{3}{5} + \frac{1}{5} = ?$

3. Subtract the fractions.

a)



b)



c) $\frac{4}{4} - \frac{1}{4} = ?$ d) $\frac{3}{5} - \frac{1}{5} = ?$ e) $\frac{1}{2} - \frac{1}{2} = ?$ f) $\frac{8}{10} - \frac{3}{10} = ?$

4. What unit would you use to measure each of these— kilometres, metres, centimetres, or millimetres?

a) the length of a straight pin
b) the distance from your school to Ottawa
c) the length of a football field
d) the height of this book
e) the height of an apartment building
f) the perimeter of a shoe box

1. a) $\frac{5}{10}, \frac{1}{2}$ b) $\frac{4}{10}, \frac{2}{5}$ c) $\frac{1}{2}, \frac{2}{4}$

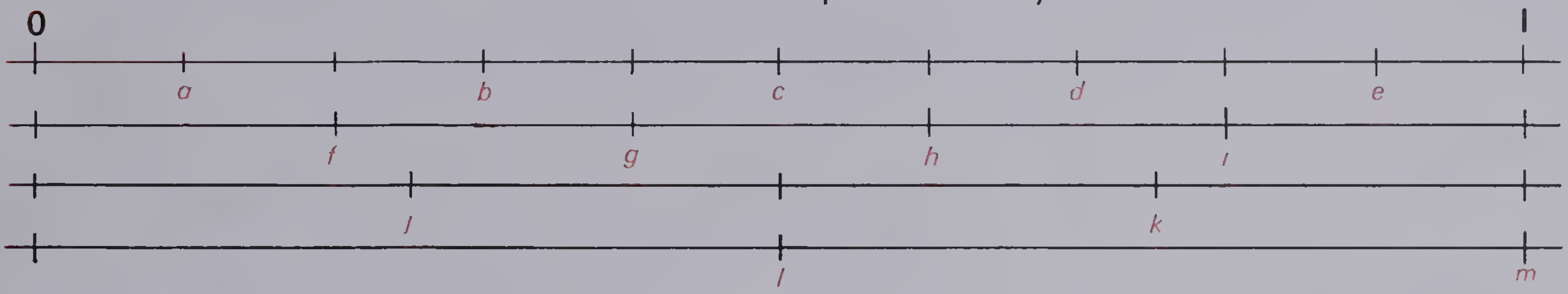
2. a) $\frac{5}{10} + \frac{3}{10} = \frac{8}{10}$ b) $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$ c) $\frac{7}{10}$ d) $\frac{4}{4}$ or 1 e) $\frac{9}{10}$ f) $\frac{4}{5}$

3. a) $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$ b) $\frac{9}{10} - \frac{4}{10} = \frac{5}{10}$ c) $\frac{3}{4}$ d) $\frac{2}{5}$ e) 0 f) $\frac{5}{10}$

4. a) mm b) km c) m d) cm e) m f) cm

Practice 2

1. Write the fractions represented by letters.



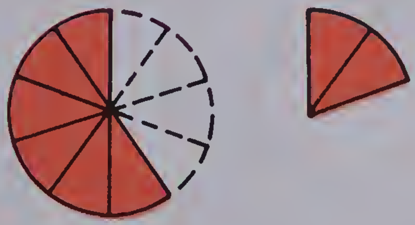
2. Write fractions equivalent to: a) $\frac{1}{2}$ b) $\frac{2}{5}$ c) $\frac{6}{10}$ d) $\frac{4}{4}$

3. Complete, using $>$ or $<$.

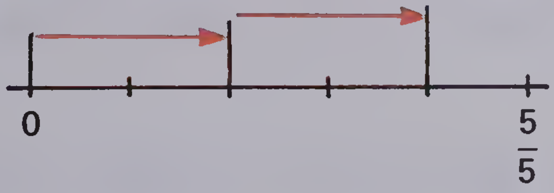
a) $\frac{5}{10} ? \frac{4}{5}$ b) $\frac{3}{4} ? \frac{6}{10}$ c) $\frac{3}{10} ? \frac{1}{2}$ d) $\frac{4}{10} ? \frac{1}{4}$ e) $\frac{2}{5} ? \frac{3}{10}$ f) $\frac{1}{5} ? \frac{1}{4}$

4. Write an addition sentence for each picture.

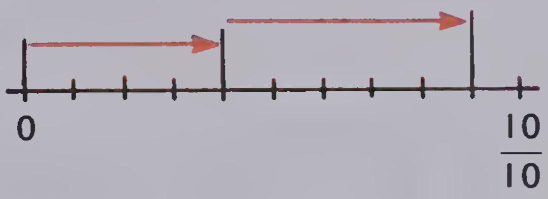
a)



b)

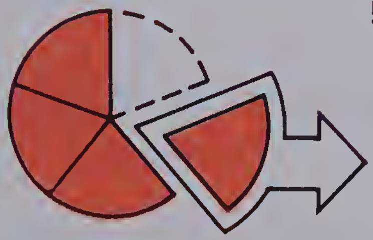


c)

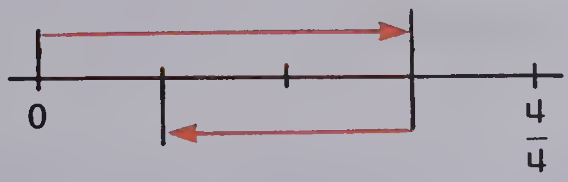


5. Write a subtraction sentence for each picture.

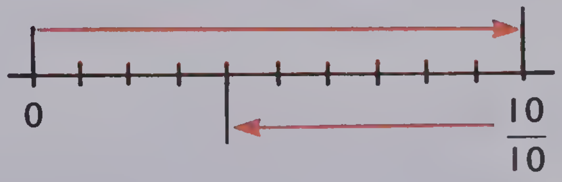
a)



b)

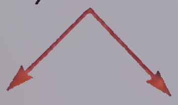


c)

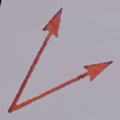


6. Right angle, greater than a right angle, or less than a right angle?

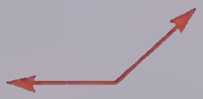
a)



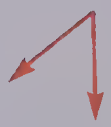
b)



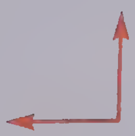
c)



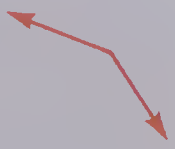
d)



e)



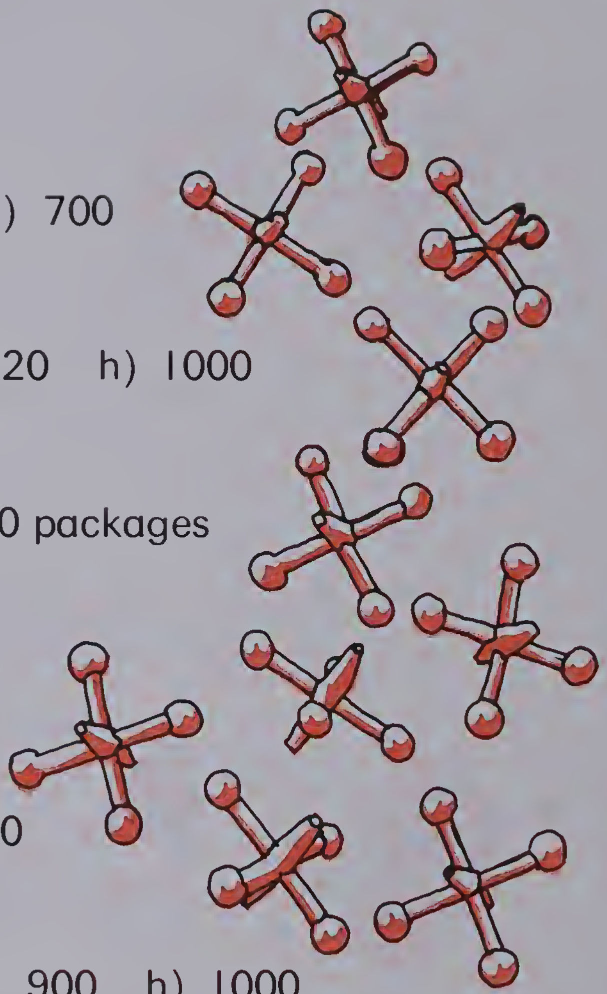
f)



7. Use a ruler to draw line segments with these lengths.
a) 14 cm b) 14 mm c) 22 mm d) 2 cm e) 37 mm f) 17 cm g) 8 mm h) 45 mm

Unit 3, Check 3

Knowing how to multiply and divide by 10 and 100 is important.
Check your work with the answers at the bottom of the page.



1. Multiply by 10.
   a) 3 b) 7 c) 23 d) 35 e) 50 f) 100 g) 400 h) 700
2. Divide by 10.
   a) 40 b) 80 c) 100 d) 300 e) 500 f) 560 g) 920 h) 1000
3. Jacks are packaged in tens. How many jacks?
   a) 6 packages b) 18 packages c) 47 packages d) 300 packages
4. How many packages of jacks could you make?
   a) 70 jacks b) 120 jacks c) 540 jacks d) 2000 jacks
5. Multiply by 100.
   a) 1 b) 2 c) 5 d) 10 e) 20 f) 50 g) 70 h) 90
6. Divide by 100.
   a) 200 b) 300 c) 400 d) 600 e) 700 f) 800 g) 900 h) 1000
7. How many cents?
   a) 3 dollars b) 7 dollars c) 30 dollars d) 40 dollars e) 60 dollars f) 80 dollars
8. How many dollars?
   a) 100 pennies b) 500 pennies c) 300 pennies d) 700 pennies e) 1000 pennies

1. a) 30 b) 70 c) 230 d) 350 e) 500 f) 1000 g) 4000 h) 7000
2. a) 4 b) 8 c) 10 d) 30 e) 50 f) 56 g) 92 h) 100
3. a) 60 jacks b) 180 jacks c) 470 jacks d) 3000 jacks
4. a) 7 packages b) 12 packages c) 54 packages d) 200 packages
5. a) 100 b) 200 c) 500 d) 1000 e) 2000 f) 5000 g) 7000 h) 9000
6. a) 2 b) 3 c) 4 d) 6 e) 7 f) 8 g) 9 h) 10
7. a) 300 cents b) 700 cents c) 3000 cents d) 4000 cents e) 6000 cents f) 8000 cents
8. a) 1 dollar b) 5 dollars c) 3 dollars d) 7 dollars e) 10 dollars

Practice 3

1. Complete the patterns.
   a) $1 \times 10 = 10$ to $9 \times 10 = 90$
   b) $10 \times 10 = 100$ to $90 \times 10 = 900$
   c) $17 \times 10 = 170$ to $97 \times 10 = ?$
   d) $14 \times 10 = 140$ to $94 \times 10 = ?$

2. Complete the patterns.
   a) $10 \div 10 = 1$ to $90 \div 10 = 9$
   b) $100 \div 10 = 10$ to $900 \div 10 = 90$
   c) $120 \div 10 = 12$ to $920 \div 10 = ?$
   d) $150 \div 10 = 15$ to $950 \div 10 = ?$

3. How many cents?
   a) 1 dime b) 5 dimes c) 8 dimes d) 10 dimes e) 23 dimes f) 46 dimes

4. How many dimes?
   a) 10 pennies b) 30 pennies c) 100 pennies d) 720 pennies e) 950 pennies

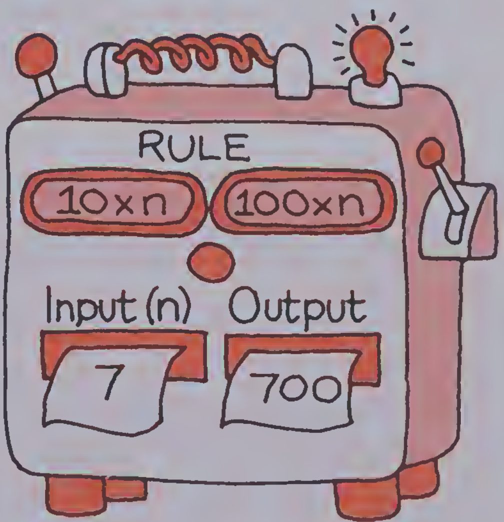
5. Complete the patterns.
   a) $1 \times 100 = 100$ to $9 \times 100 = 900$
   b) $10 \times 100 = 1000$ to $90 \times 100 = 9000$
   c) $11 \times 100 = 1100$ to $91 \times 100 = ?$
   d) $15 \times 100 = 1500$ to $95 \times 100 = ?$

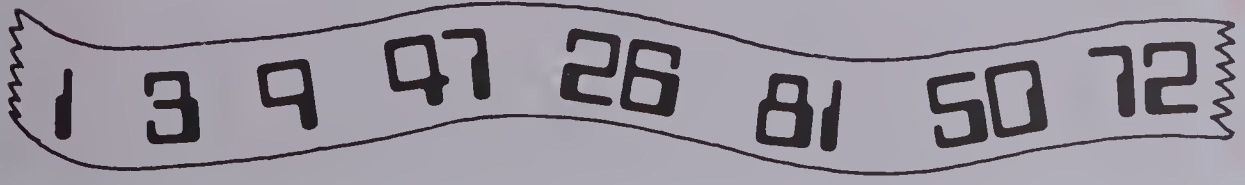
6. Complete the patterns.
   a) $100 \div 100 = 1$ to $900 \div 100 = 9$
   b) $1000 \div 100 = 10$ to $9000 \div 100 = 90$
   c) $1300 \div 100 = 13$ to $9300 \div 100 = ?$
   d) $1600 \div 100 = 16$ to $9600 \div 100 = ?$

7. What is the length in centimetres?
   a) 1 m b) 3 m c) 5 m d) 8 m e) 10 m

8. What is the length in metres?
   a) 100 cm b) 400 cm c) 600 cm d) 900 cm e) 1000 cm

9. This computer multiplies by 10 or by 100.
   Give its output for the following input.
   a) if the rule is $n \rightarrow 10 \times n$, b) if the rule is $n \rightarrow 100 \times n$.





Unit 3, Check 4

Check your progress with multiplication and division.
See page 237 if you need more practice.

1. Multiply. Record your estimate first.

a)	b)	c)	d)	e)	f)	g)	h)
26	94	32	45	87	58	73	61
19	42	23	35	34	28	47	16

2. Multiply. Don't forget to estimate!

a)	b)	c)	d)	e)	f)	g)	h)
86	27	93	38	41	69	52	74
53	78	57	71	66	84	62	89

3. Divide.

a) 9)231 b) 4)149 c) 8)355 d) 5)282 e) 7)278 f) 6)292

4. Divide.

a) 6)381 b) 9)653 c) 5)406 d) 8)780 e) 4)274 f) 7)538

5. Solve.

a) $165 + n = 13 + 165$ b) $p + 816 = 816 + 41$ c) $53 \times 61 = k \times 53$
d) $42 \times 87 = 87 \times m$ e) $(219 + 508) + 156 = 219 + (f + 156)$
f) $93 \times (12 \times 34) = (93 \times 12) \times a$

6. Find the answers. Show the order you used.

a) 87 + 13 + 42 b) 96 + 36 + 64 c) 281 + 219 + 386
d) 749 + 307 + 693 e) 6 × 4 × 25 f) 5 × 2 × 76
g) 20 × 5 × 39 h) 36 × 25 × 8 i) 50 x 43 × 4

1. a) 494 b) 3948 c) 736 d) 1575 e) 2958 f) 1624 g) 3431 h) 976
2. a) 4558 b) 2106 c) 5301 d) 2698 e) 2706 f) 5796 g) 3224 h) 6586
3. a) 25R6 b) 37R1 c) 44R3 d) 56R2 e) 39R5 f) 48R4
4. a) 63R3 b) 72R5 c) 81R1 d) 97R4 e) 68R2 f) 76R6
5. a) $n = 13$ b) $p = 41$ c) $k = 61$ d) $m = 42$ e) $f = 508$ f) $a = 34$
6. a) 142 b) 196 c) 886 d) 1749 e) 600 f) 760 g) 3900 h) 7200 i) 8600

Practice 4

1. Multiply this way.

$$\begin{array}{rr} 56 = & 50 + 6 \\ 24 = & 20 + 4 \\ \hline & 1000 + 120 + 200 + 24 \\ & = 1344 \end{array}$$

a)	b)	c)	d)	e)	f)	g)	h)
88	79	67	59	49	36	29	17
13	24	43	33	31	46	18	22

2. Multiply this way. Check your answer by estimating.

$$\begin{array}{r} 38 \\ 62 \\ \hline 16 \\ 60 \\ 480 \\ 1800 \\ \hline 2356 \end{array}$$

a)	b)	c)	d)	e)	f)
15	21	85	92	99	38
54	83	64	75	57	74

g)	h)	i)	j)	k)	l)
14	55	96	41	27	52
65	77	51	82	63	81

3. Divide. Estimate carefully.

$$\begin{array}{r|r} 8\overline{)580} & \\ 560 & 70 \\ \hline 20 & \\ 16 & 2 \\ \hline 4 & 72 \end{array}$$

a) $6\overline{)246}$ b) $4\overline{)112}$ c) $9\overline{)261}$ d) $7\overline{)238}$ e) $9\overline{)333}$

f) $9\overline{)750}$ g) $8\overline{)658}$ h) $9\overline{)733}$ i) $7\overline{)669}$ j) $6\overline{)326}$

4. Solve. Remember the either-order rule.

a) $k + 29 = 29 + 72$ b) $w + 86 = 86 + 41$ c) $169 + 743 = p + 169$

d) $582 + 473 = y + 582$ e) $n \times 48 = 48 \times 35$ f) $d \times 91 = 91 \times 52$

g) $69 \times 26 = m \times 69$ h) $74 \times 86 = c \times 74$

5. Find the answers.

a) $49 + (84 + 16)$ b) $(73 + 27) + 94$ c) $157 + 43 + 73$

d) $(40 \times 5) \times 9$ e) $27 \times (4 \times 25)$ f) $50 \times 29 \times 6$

Serpentine

Use the answer from one question to form the next question.
Check : Your final answer should be the first number in the Serpentine.
There are check points in the Serpentine.

Start

25 × 5 =
? + 11 =
? ÷ 4 =
? + 18 =
? means 5 tens and
2 × 48 =
? ÷ 6 =
? × 3 =
? × 3 =
? ÷ 12 =
12 × 7 =
? − 19 =
? ÷ 5 =
? × 8 =
? + 46 =
? ÷ 3 =
? × 100 =
? + 300 + 20 + 7 =
5327 − 4327 =
? ÷ 10 =
? × 42 =
? + 3907 =
? = 8000 + 100 + 7
7 × 63 =
? − 37 =
? ÷ 4 =
? means 1 hundred and
1 × 94 =
? + 1837 =
? − 764 =
? means 1 thousand, 1 hundred, 6 tens, and
7 × 83 =
581 + 379 =
? ÷ 10 =
? ÷ 8 =
? × 63 =
? = 700 + 50 +
6 × 74 =
? ÷ 4 =
? × 10 =
? − 876 =
? ÷ 9 =
? × 59 =
1534 + 3462 =
? = 4000 + 900 + 90 +
6 × (8 × 5) =
? ÷ 10 =
? × 76 =
? − 947 =
? = 800 + 70 +
7 × 6 × 5 =
? ÷ 3 =
? × 100 =
? ÷ 4 =
1750 + 4869 =
? − 619 =
? ÷ 10 =
? + 90 + 6 =
? ÷ 6 =
? − 87 =
? × 45 =
? means 1 thousand, 3 hundreds, and
5 × 9 × 20 =
? ÷ 10 =
? ÷ 3 =
30 × 69 =
? ÷ 10 =
? + 5893 =
? ÷ 100 =
? × 34 =
? − 965 =
? = 1000 + 100 +
9 × 5 × 4 =
? ÷ 10 =
? × 54 =
? ÷ 6 =
? + 4838 =
? ÷ 100 =
? ÷ 2 =

Finish

4

Column Addition

If you know the number pair and the operation, you can think the answer.

Number pair	Operation	Answer
(9, 8)	Addition	17

Do column addition this way.

Add.
$$\begin{array}{r}6\\8\\9\\\hline 23\end{array}$$

Think	Record
17, 23	23

Add.
$$\begin{array}{r}26\\38\\89\\\hline 153\end{array}$$

Think	Record
17, 23	3
10, 13, 15	15

IN ACTION

1. Add.

a)	b)	c)	d)	e)	f)	g)	h)
5 7 8	8 6 7	9 3 4	5 9 5	6 7 9	8 7 5	9 8 9	5 9 4
i)	j)	k)	l)	m)	n)	o)	p)
4 6 8	9 8 7	5 9 9	8 7 6	7 5 3	7 1 9	9 8 2	7 8 8

2. Add.

a)	b)	c)	d)	e)	f)	g)
25 34 26	21 32 14	16 49 88	62 40 37	48 53 21	25 35 45	44 37 25
h)	i)	j)	k)	l)	m)	n)
89 65 44 37	23 32 43 56	25 32 49 26	18 15 19 17	43 16 27 18	32 21 49 19	32 48 56 21

EXPLORE

Column Addition

Add.

$$\begin{array}{r} 189\uparrow \\ 238\uparrow \\ 426\,\rvert \\ \hline 853 \end{array}$$

Think	Record
14, 23	3
4, 7, 15	5
5, 7, 8	8

Find the total amount.

$$\begin{array}{r} \$6.29\uparrow \\ 8.53\uparrow \\ 4.78\,\rvert \\ \hline \$19.60 \end{array}$$

Think	Record
11, 20	0
9, 14, 16	6
5, 13, 19	19

IN ACTION

1. Add.

a)	b)	c)	d)	e)	f)
126	239	327	175	316	236
240	346	312	249	406	225
428	215	308	332	124	273

g)	h)	i)	j)	k)	l)
$1.56	$3.84	$3.77	$2.49	$4.44	$4.28
1.47	1.67	2.24	1.67	3.93	2.53
1.43	2.43	6.51	3.18	1.67	1.27

2. Add.

a)	b)	c)	d)	e)	f)
306	9	27	15	138	237
9	452	10	149	407	1
27	27	104	6	16	66

g)	h)	i)	j)	k)	l)
$2.75	$0.16	$0.25	$8.72	$9.52	$0.50
0.98	5.50	8.04	0.15	0.65	0.58
0.47	0.05	0.20	0.29	2.39	1.37

Pee Wee Hockey League

3.

Club Scoring Leaders

Tigers

Player	Goals	Assists
Phil	68	77
Bobby	32	90
Ken	50	55

Bears

Player	Goals	Assists
Richard	52	34
Rene	21	44
Don	26	30

Road Runners

Player	Goals	Assists
Marcel	24	53
Mickey	51	26
Red	24	42

Lions

Player	Goals	Assists
Frank	31	49
Yvan	40	33
Pete	36	37

Aces

Player	Goals	Assists
Denis	17	37
Bill	23	27
Ralph	23	20

Elks

Player	Goals	Assists
Brad	25	57
Rod	36	41
Pete	25	45

Foxes

Player	Goals	Assists
Darryl	38	46
Norm	22	47
Paul	24	31

Martins

Player	Goals	Assists
Andres	16	59
Dennis	26	31
Don	23	25

a) Which player had the greatest point total (goals plus assists)?

b) Which player had the lowest point total?

c) What was the total number of goals scored by the 4 highest scorers?

d) How many goals did Darryl, Norm and Paul score altogether?

e) How many goals did the 3 players on each team score?
Order these total scores.

4. Fill in the missing digits.

a)	b)	c)	d)	e)	f)	g)
9	3	4?	?7	12?	3?4	5?6
?	5	?8	92	?36	22?	29?
6	?	21	7?	1?5	?56	?33
19	16	106	194	530	688	1230

5. Complete each magic square.

a)

	3	8
9	5	1
	7	6

b)

11		6
4	9	
12		7

c)

		7
	8	6
9		11

d)

	11	
9	10	14

e)

	7	
5	5	5
6		6

f)

7		11
14	10	6
	8	

g)

	20	
18	22	26
23	24	

h)

43		47
	44	
41		45

6. a) The sum of 3 of these numbers is 122. What are the 3 numbers?

22 34 42 37 25 46

b) The sum of 3 of these numbers is 139. What are the 3 numbers?

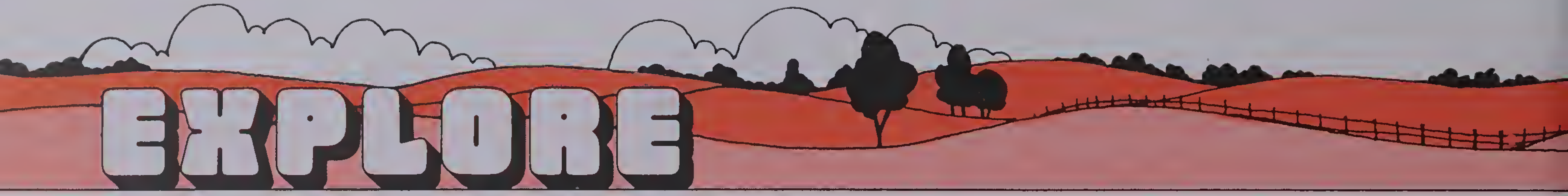
22 54 19 66 51 62

c) The sum of 4 of these numbers is 201. What are the 4 numbers?

93 89 34 28 36 27 39 41

d) The sum of 4 of these numbers is 217. What are the 4 numbers?

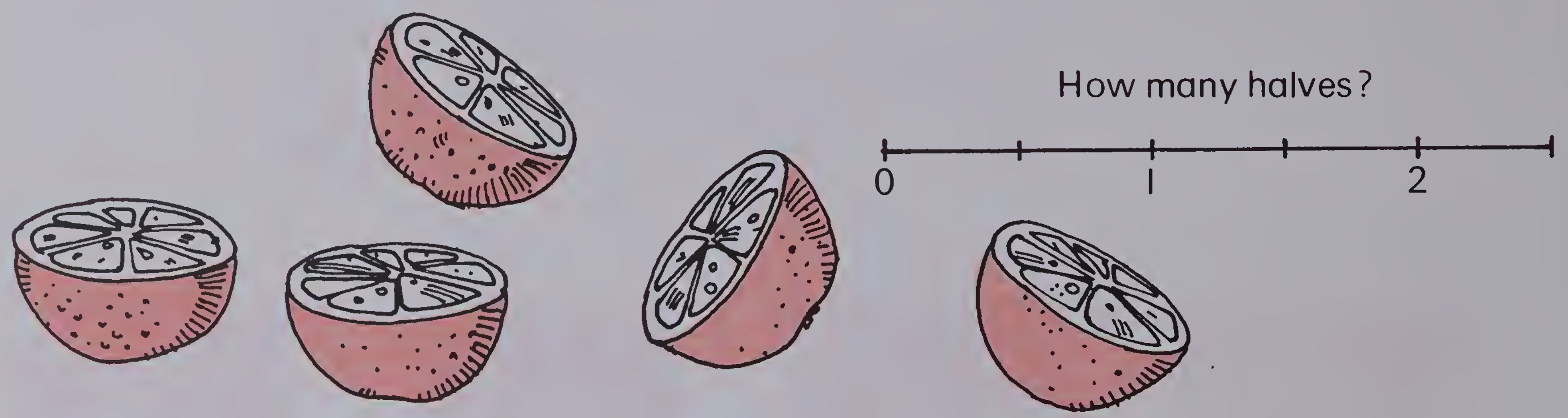
11 65 89 46 9 62 85 44



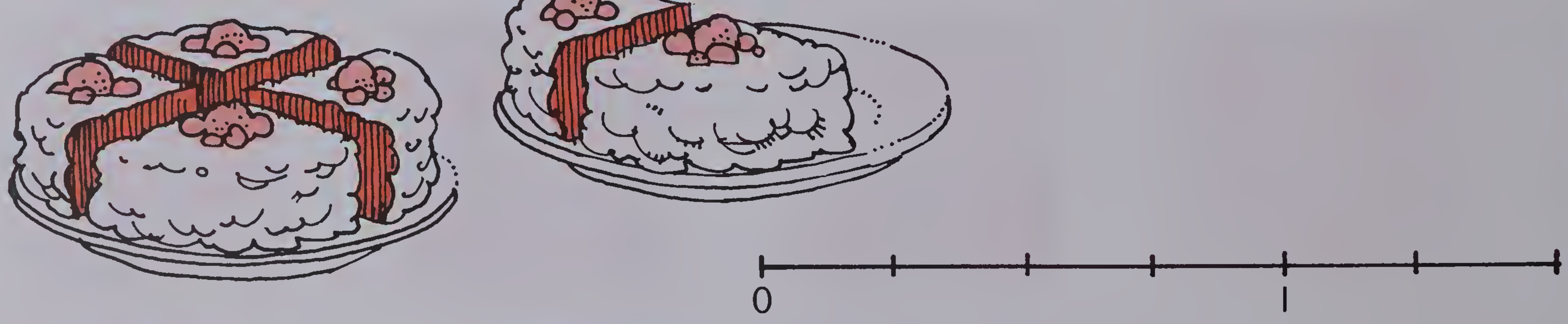
EXPLORE

Fractions Greater Than I

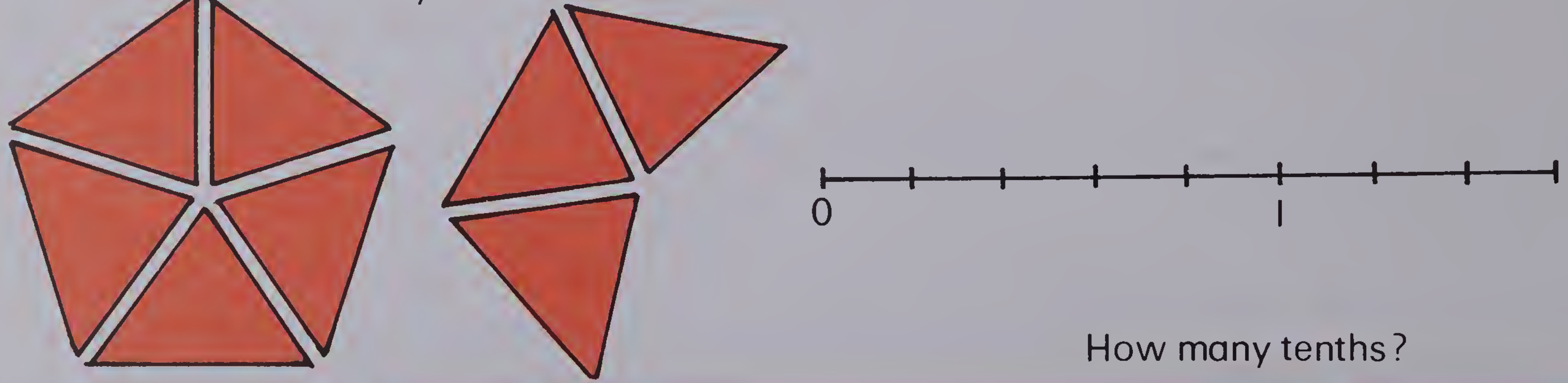
How many halves?



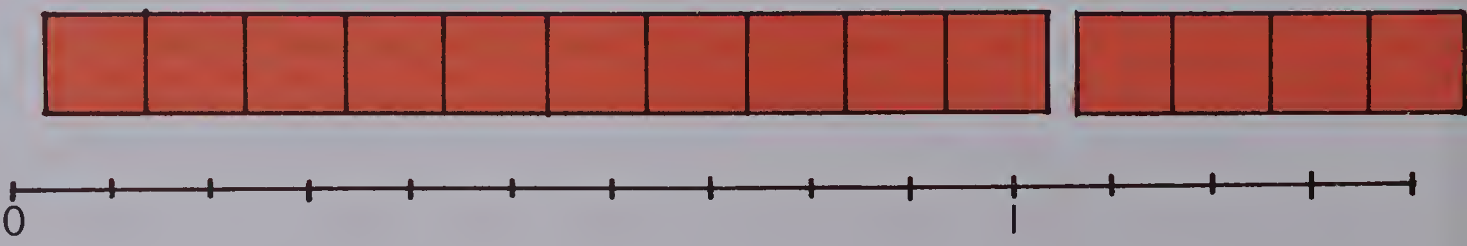
How many quarters?



How many fifths?

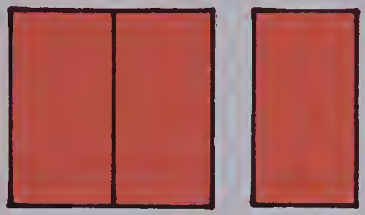


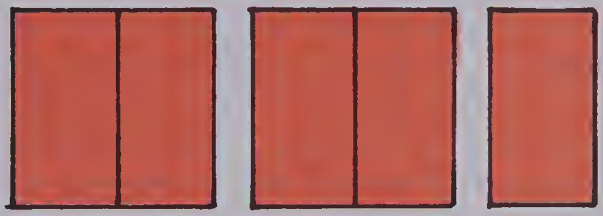
How many tenths?

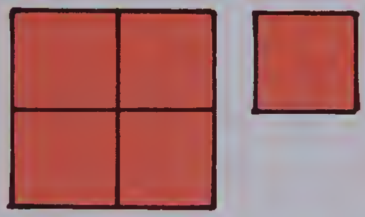


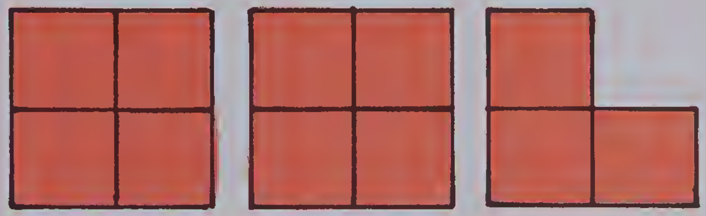
IN ACTION

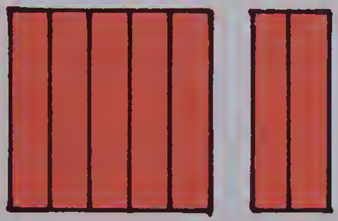
1. Write a fraction for each illustration.

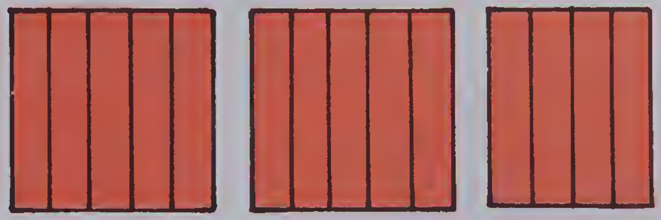
a) 

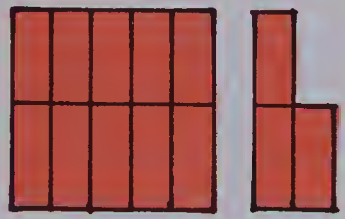
b) 

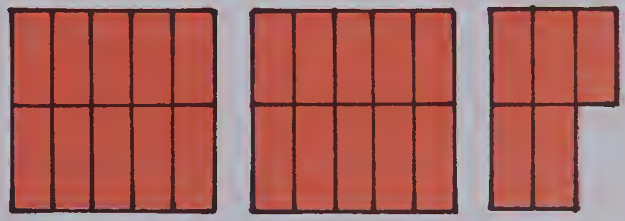
c) 

d) 

e) 

f) 

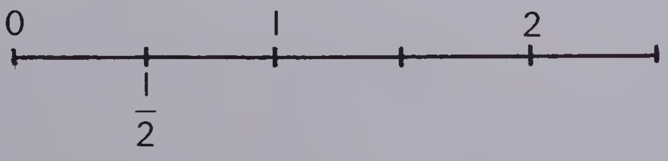
g) 

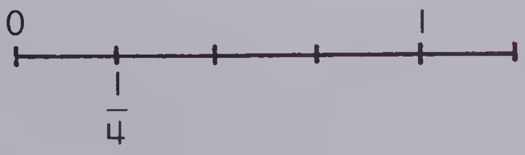
h) 

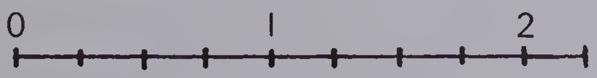
2. Illustrate each fraction.

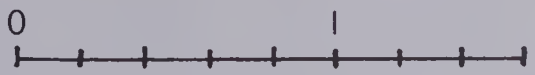
a) $\frac{3}{2}$ b) $\frac{6}{4}$ c) $\frac{10}{4}$ d) $\frac{6}{5}$ e) $\frac{12}{5}$ f) $\frac{12}{10}$ g) $\frac{18}{10}$ h) $\frac{24}{10}$

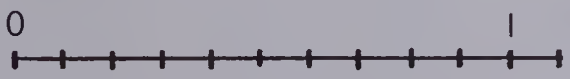
3. Write a fraction for each point marked on the number line.

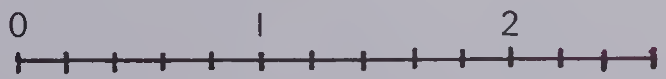
a) 

b) 

c) 

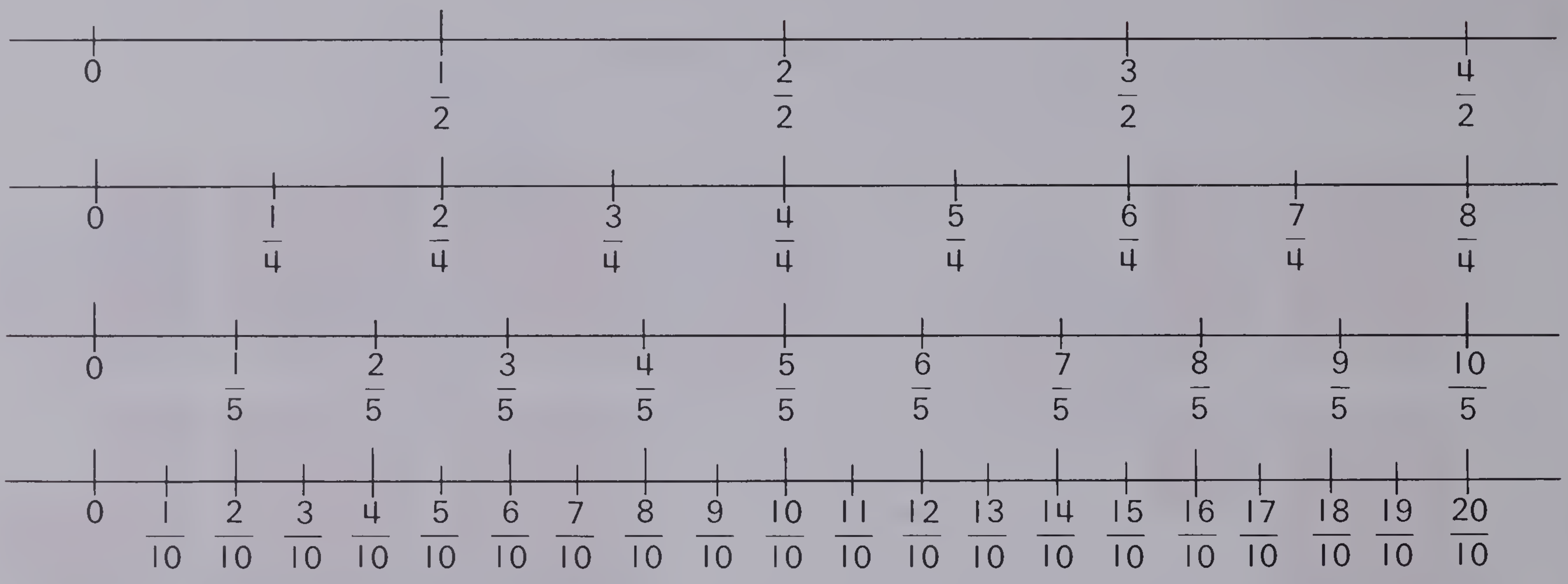
d) 

e) 

f) 

EXPLORE

Equivalent Fractions


0 1/2 2/2 3/2 4/2
0 1/4 2/4 3/4 4/4 5/4 6/4 7/4 8/4
0 1/5 2/5 3/5 4/5 5/5 6/5 7/5 8/5 9/5 10/5
0 1/10 2/10 3/10 4/10 5/10 6/10 7/10 8/10 9/10 10/10 11/10 12/10 13/10 14/10 15/10 16/10 17/10 18/10 19/10 20/10

$\frac{2}{5} = \frac{4}{10}$ $\frac{1}{2} = \frac{2}{4} = \frac{?}{10}$ $\frac{16}{10} = \frac{8}{?}$

IN ACTION

1. Use the number lines above to complete the equations.

a) $\frac{1}{5} = \frac{?}{10}$ b) $\frac{2}{4} = \frac{5}{?}$ c) $\frac{?}{10} = \frac{2}{4}$ d) $\frac{4}{?} = \frac{2}{5}$ e) $\frac{1}{?} = \frac{5}{10}$

f) $\frac{2}{2} = \frac{?}{5}$ g) $\frac{?}{4} = \frac{10}{10}$ h) $\frac{5}{?} = \frac{10}{10}$ i) $\frac{10}{10} = \frac{2}{?}$ j) $\frac{2}{?} = \frac{4}{4}$

k) $\frac{14}{10} = ?$ l) $? = \frac{10}{5}$ m) $? = \frac{3}{2}$ n) $\frac{6}{4} = ?$ o) $? = \frac{18}{10}$

p) $? = \frac{8}{4}$ q) $\frac{4}{2} = ?$ r) $? = \frac{20}{10}$ s) $\frac{10}{5} = ?$ t) $\frac{20}{?} = \frac{4}{?}$

2. Sort the fractions into sets of equivalent fractions.

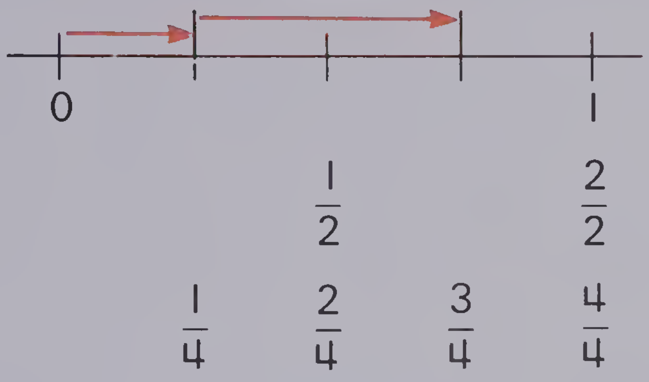
$\frac{1}{2}$ $\frac{18}{10}$ $\frac{2}{5}$ $\frac{4}{4}$ $\frac{10}{5}$ $\frac{9}{5}$ $\frac{10}{10}$ $\frac{2}{4}$ $\frac{4}{10}$ $\frac{3}{2}$

$\frac{8}{4}$ $\frac{4}{2}$ $\frac{5}{5}$ $\frac{5}{10}$ $\frac{2}{2}$ $\frac{20}{10}$ $\frac{12}{10}$ $\frac{6}{5}$ $\frac{15}{10}$ $\frac{6}{4}$

EXPLORE

Adding Fractions / Unlike Denominators

Find $\frac{1}{4} + \frac{1}{2}$.



$$\frac{1}{4} + \frac{1}{2} = \frac{1}{4} + \frac{2}{4}$$
$$= \frac{3}{4}$$

$$\frac{1}{2} = \frac{2}{4}$$

IN ACTION

1. Use the correct symbol, < or > or = .

a) $\frac{1}{2}$? $\frac{5}{10}$ b) $\frac{5}{4}$? $\frac{4}{5}$ c) $\frac{2}{5}$? $\frac{2}{4}$ d) $\frac{5}{10}$? $\frac{1}{4}$ e) $\frac{12}{10}$? $\frac{10}{5}$

f) $\frac{7}{4}$? $\frac{20}{10}$ g) $\frac{9}{5}$? $\frac{18}{10}$ h) $\frac{4}{2}$? $\frac{8}{4}$ i) $\frac{5}{5}$? $\frac{6}{4}$ j) $\frac{3}{4}$? $\frac{4}{10}$

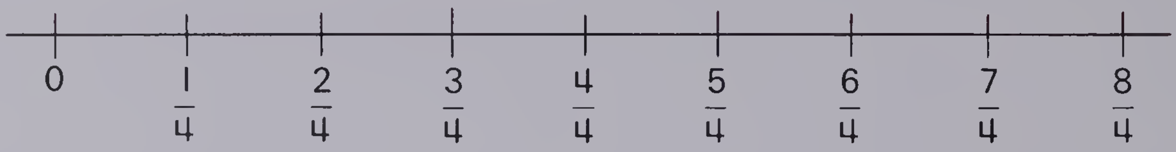
k) $\frac{1}{5}$? $\frac{1}{10}$ l) $\frac{3}{10}$? $\frac{4}{4}$ m) $\frac{3}{2}$? $\frac{15}{10}$ n) $\frac{7}{10}$? $\frac{3}{5}$ o) $\frac{6}{5}$? $\frac{11}{10}$

2. Write the equivalent fractions.

a) $\frac{2}{4} = \frac{?}{2}$ b) $\frac{2}{?} = \frac{4}{4}$ c) $\frac{6}{4} = \frac{3}{?}$ d) $\frac{?}{2} = \frac{8}{4}$

e) $\frac{1}{2} = \frac{?}{4}$ f) $\frac{4}{?} = \frac{2}{2}$ g) $\frac{3}{2} = \frac{?}{4}$ h) $\frac{?}{4} = \frac{4}{2}$

3. Complete. Use a number line for each question.

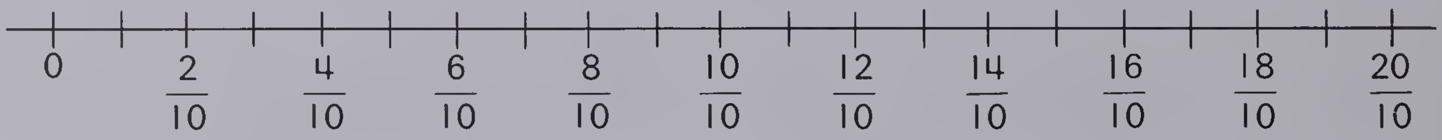

0
$\frac{1}{4}$
$\frac{2}{4}$
$\frac{3}{4}$
$\frac{4}{4}$
$\frac{5}{4}$
$\frac{6}{4}$
$\frac{7}{4}$
$\frac{8}{4}$

a) $\frac{1}{2} + \frac{1}{4} = ?$
b) $\frac{1}{4} + ? = \frac{3}{4}$
c) $\frac{2}{4} + \frac{1}{2} = ?$
d) $\frac{1}{2} + ? = \frac{4}{4}$
e) $\frac{3}{4} + \frac{1}{2} = ?$
f) $\frac{3}{2} + ? = \frac{7}{4}$
g) $\frac{2}{2} + \frac{3}{4} = ?$
h) $? + \frac{2}{2} = \frac{5}{4}$

4. Write the equivalent fractions.

a) $\frac{1}{5} = \frac{?}{10}$
b) $\frac{4}{?} = \frac{2}{5}$
c) $\frac{3}{5} = \frac{6}{?}$
d) $\frac{?}{10} = \frac{4}{5}$
e) $\frac{5}{5} = \frac{?}{10}$
f) $\frac{12}{?} = \frac{6}{5}$
g) $\frac{7}{5} = \frac{14}{?}$
h) $\frac{?}{10} = \frac{8}{5}$
i) $\frac{9}{5} = \frac{?}{10}$
j) $\frac{20}{?} = \frac{10}{5}$
k) $\frac{2}{10} = \frac{1}{?}$
l) $\frac{?}{5} = \frac{4}{10}$
m) $\frac{6}{10} = \frac{?}{5}$
n) $\frac{4}{?} = \frac{8}{10}$
o) $\frac{10}{10} = \frac{5}{?}$
p) $\frac{?}{5} = \frac{12}{10}$
q) $\frac{14}{10} = \frac{?}{5}$
r) $\frac{8}{?} = \frac{16}{10}$
s) $\frac{18}{10} = \frac{9}{?}$
t) $\frac{?}{5} = \frac{20}{10}$

5. Complete. Use a number line for each question.

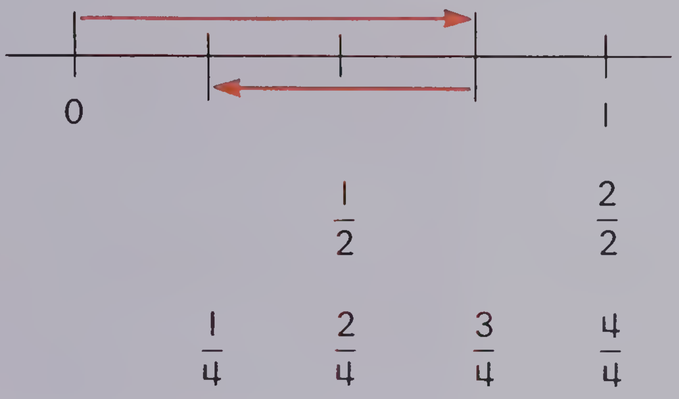

0
$\frac{2}{10}$
$\frac{4}{10}$
$\frac{6}{10}$
$\frac{8}{10}$
$\frac{10}{10}$
$\frac{12}{10}$
$\frac{14}{10}$
$\frac{16}{10}$
$\frac{18}{10}$
$\frac{20}{10}$

a) $\frac{1}{5} + \frac{17}{10} = \frac{?}{10}$
b) $\frac{9}{10} + \frac{3}{5} = \frac{15}{?}$
c) $\frac{2}{5} + \frac{2}{10} = \frac{?}{5}$
d) $\frac{8}{10} + \frac{4}{5} = \frac{8}{?}$
e) $\frac{?}{5} + \frac{14}{10} = \frac{20}{10}$
f) $\frac{7}{?} + \frac{2}{5} = \frac{11}{10}$
g) $\frac{4}{5} + \frac{?}{10} = \frac{11}{10}$
h) $\frac{6}{10} + \frac{3}{?} = \frac{6}{5}$
i) $\frac{?}{5} + \frac{9}{10} = \frac{19}{10}$
j) $\frac{4}{10} + \frac{?}{5} = \frac{12}{10}$
k) $\frac{6}{5} + \frac{4}{?} = \frac{8}{5}$
l) $\frac{1}{10} + \frac{7}{5} = \frac{?}{10}$

EXPLORE

Subtracting Fractions / Unlike Denominators

Find $\frac{3}{4} - \frac{1}{2}$.



$$\frac{3}{4} - \frac{1}{2} = \frac{3}{4} - \frac{2}{4}$$

$$= \frac{1}{4}$$

$$\frac{1}{2} = \frac{2}{4}$$

IN ACTION

1. Use the correct symbol, $<$ or $>$ or $=$.

a) $\frac{2}{2}$? $\frac{5}{5}$ b) $\frac{3}{4}$? $\frac{1}{2}$ c) $\frac{2}{5}$? $\frac{6}{10}$ d) $\frac{9}{10}$? $\frac{4}{5}$ e) $\frac{7}{5}$? $\frac{14}{10}$

f) $\frac{5}{4}$? $\frac{3}{2}$ g) $\frac{9}{5}$? $\frac{17}{10}$ h) $\frac{1}{4}$? $\frac{5}{10}$ i) $\frac{10}{10}$? $\frac{4}{4}$ j) $\frac{13}{10}$? $\frac{6}{5}$

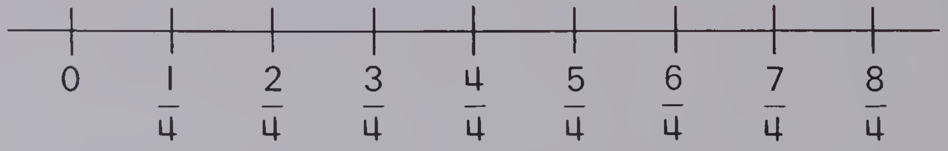
k) $\frac{3}{5}$? $\frac{7}{10}$ l) $\frac{18}{10}$? $\frac{8}{5}$ m) $\frac{6}{4}$? $\frac{15}{10}$ n) $\frac{1}{5}$? $\frac{3}{10}$ o) $\frac{8}{5}$? $\frac{9}{10}$

2. Write the equivalent fractions.

a) $\frac{4}{4} = \frac{?}{2}$ b) $\frac{1}{2} = \frac{2}{?}$ c) $\frac{4}{?} = \frac{8}{4}$ d) $\frac{?}{4} = \frac{3}{2}$

e) $\frac{?}{4} = \frac{1}{2}$ f) $\frac{3}{?} = \frac{6}{4}$ g) $\frac{2}{2} = \frac{4}{?}$ h) $\frac{8}{4} = \frac{?}{2}$

3. Complete. Use a number line for each question.


0
$\frac{1}{4}$
$\frac{2}{4}$
$\frac{3}{4}$
$\frac{4}{4}$
$\frac{5}{4}$
$\frac{6}{4}$
$\frac{7}{4}$
$\frac{8}{4}$

a) $\frac{4}{4} - \frac{1}{2} = ?$

b) $\frac{3}{4} - ? = \frac{1}{2}$

c) $? - \frac{2}{4} = \frac{1}{2}$

d) $\frac{3}{4} - ? = \frac{1}{4}$

e) $\frac{5}{4} - \frac{2}{2} = ?$

f) $\frac{5}{4} - ? = \frac{3}{4}$

g) $\frac{7}{4} - \frac{1}{2} = ?$

h) $? - \frac{3}{2} = \frac{1}{4}$

4. Write the equivalent fractions.

a) $\frac{?}{10} = \frac{1}{2}$

b) $\frac{10}{5} = \frac{?}{10}$

c) $\frac{1}{?} = \frac{2}{10}$

d) $\frac{?}{10} = \frac{10}{5}$

e) $\frac{4}{10} = \frac{2}{?}$

f) $\frac{9}{5} = \frac{?}{10}$

g) $\frac{?}{5} = \frac{4}{10}$

h) $\frac{?}{10} = \frac{9}{5}$

i) $\frac{6}{10} = \frac{?}{5}$

j) $\frac{8}{5} = \frac{?}{10}$

k) $\frac{?}{5} = \frac{6}{10}$

l) $\frac{?}{10} = \frac{8}{5}$

m) $\frac{8}{10} = \frac{?}{5}$

n) $\frac{7}{5} = \frac{?}{10}$

o) $\frac{?}{5} = \frac{8}{10}$

p) $\frac{?}{10} = \frac{7}{5}$

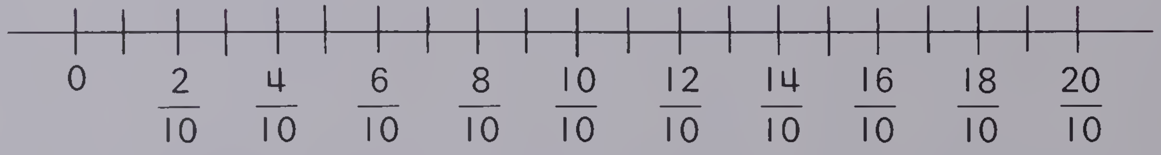
q) $\frac{10}{10} = \frac{?}{5}$

r) $\frac{6}{5} = \frac{?}{10}$

s) $\frac{?}{5} = \frac{10}{10}$

t) $\frac{?}{10} = \frac{6}{5}$

5. Complete. Use a number line for each question.


0
$\frac{2}{10}$
$\frac{4}{10}$
$\frac{6}{10}$
$\frac{8}{10}$
$\frac{10}{10}$
$\frac{12}{10}$
$\frac{14}{10}$
$\frac{16}{10}$
$\frac{18}{10}$
$\frac{20}{10}$

a) $\frac{15}{10} - \frac{7}{5} = \frac{?}{10}$

b) $\frac{19}{10} - \frac{?}{10} = \frac{1}{5}$

c) $\frac{?}{5} - \frac{4}{10} = \frac{6}{5}$

d) $\frac{15}{?} - \frac{3}{5} = \frac{9}{10}$

e) $\frac{12}{10} - \frac{4}{?} = \frac{4}{10}$

f) $\frac{3}{5} - \frac{2}{10} = \frac{2}{?}$

g) $\frac{19}{10} - \frac{5}{5} = \frac{?}{10}$

h) $\frac{8}{5} - \frac{?}{10} = \frac{8}{10}$

i) $\frac{?}{5} - \frac{3}{5} = \frac{6}{10}$

j) $\frac{20}{?} - \frac{7}{5} = \frac{3}{5}$

k) $\frac{11}{10} - \frac{3}{?} = \frac{4}{5}$

l) $\frac{11}{10} - \frac{2}{5} = \frac{7}{?}$

6. Complete each chart.

a)

a	$\frac{1}{2}$	$\frac{2}{4}$	$\frac{3}{5}$	$\frac{6}{10}$	$\frac{3}{4}$	$\frac{2}{2}$	$\frac{4}{5}$	$\frac{8}{10}$	$\frac{4}{4}$	$\frac{14}{10}$
b	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{2}{10}$	$\frac{2}{5}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{10}$	$\frac{3}{5}$	$\frac{1}{2}$	$\frac{6}{5}$
$a + b$										
$a - b$										

b)

c	$\frac{3}{2}$	$\frac{5}{4}$		$\frac{4}{10}$	$\frac{7}{4}$		$\frac{5}{5}$	$\frac{5}{10}$		
d	$\frac{3}{4}$		$\frac{2}{10}$	$\frac{2}{5}$		$\frac{2}{4}$		$\frac{2}{5}$		$\frac{1}{5}$
$c + d$		$\frac{9}{4}$				$\frac{5}{2}$	$\frac{14}{10}$		$\frac{8}{4}$	$\frac{10}{5}$
$c - d$			$\frac{1}{5}$		$\frac{1}{4}$				$\frac{2}{2}$	

7. Complete by filling in the empty squares.

a) $\xrightarrow{+}$ $+\downarrow$

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$
$\frac{3}{4}$	$\frac{2}{4}$	$\frac{5}{4}$
$\frac{5}{4}$	$\frac{3}{4}$	

b) $\xrightarrow{+}$ $+\downarrow$

	$\frac{1}{5}$	
$\frac{5}{5}$		$\frac{8}{5}$
$\frac{7}{5}$		$\frac{22}{10}$

c) $\xrightarrow{+}$ $+\downarrow$

$\frac{1}{5}$		$\frac{3}{10}$
	$\frac{2}{10}$	
	$\frac{3}{10}$	$\frac{4}{5}$

d) $\xrightarrow{-}$ $-\downarrow$

$\frac{13}{10}$		$\frac{7}{10}$
$\frac{5}{5}$	$\frac{2}{5}$	
	$\frac{1}{5}$	

e) $\xrightarrow{-}$ $-\downarrow$

	$\frac{5}{4}$	
$\frac{3}{4}$		$\frac{1}{2}$
$\frac{5}{4}$		$\frac{1}{4}$

f) $\xrightarrow{-}$ $-\downarrow$

$\frac{9}{5}$		$\frac{5}{5}$
	$\frac{1}{10}$	
$\frac{8}{5}$		$\frac{9}{10}$

EXPLORE

Multiplying a Decimal by 10

Find the products.

0.8 × 10
0.8 is about 1
0.8 × 10 is about 1 × 10
or 10
0.8 × 10 = 8

3.8 × 10
3.8 is about 4
3.8 × 10 is about 4 × 10
or 40
3.8 × 10 = 38

25.8 × 10
25.8 is about 26
25.8 × 10 is about 26 × 10
or 260
25.8 × 10 = 258

IN ACTION

Find the products.

1. a) 6 × 10
0.6 × 10
b) 5 × 10
0.5 × 10
c) 9 × 10
0.9 × 10
d) 3 × 10
0.3 × 10
e) 7 × 10
0.7 × 10
f) 1 × 10
0.1 × 10

2. a) 1 × 10
2 × 10
1.4 × 10
b) 2 × 10
3 × 10
2.7 × 10
c) 6 × 10
7 × 10
6.8 × 10
d) 9 × 10
10 × 10
9.9 × 10
e) 1 × 10
2 × 10
1.1 × 10
f) 4 × 10
5 × 10
4.5 × 10
g) 3 × 10
4 × 10
3.3 × 10
h) 5 × 10
6 × 10
5.1 × 10
i) 7 × 10
8 × 10
7.9 × 10
j) 6 × 10
7 × 10
6.2 × 10
k) 12 × 10
13 × 10
12.4 × 10
l) 15 × 10
16 × 10
15.6 × 10

3. a) 0.4 × 10 b) 2.6 × 10 c) 3.8 × 10 d) 6.5 × 10 e) 7.8 × 10 f) 8.1 × 10
g) 0.9 × 10 h) 9.2 × 10 i) 10.3 × 10 j) 11.8 × 10 k) 12.4 × 10 l) 13.2 × 10

4. Multiply.
a) 17.4 by 10 b) 16.8 by 10 c) 18.2 by 10 d) 19.3 by 10
e) 20 by 10 f) 21.5 by 10 g) 24.7 by 10 h) 29.5 by 10
i) 31.6 by 10 j) 46.5 by 10

5. Multiply.
a) (0.4, 10) b) (0.8, 10) c) (1.3, 10) d) (1.8, 10) e) (2.7, 10)
f) (3.1, 10) g) (4.6, 10) h) (18.6, 10) i) (23.9, 10) j) (37.5, 10)

Multiplication / I Factor a Decimal

Find the product of 0.6 × 8.
You could find the answer this way.

$$0.6 + 0.6 + 0.6 + 0.6 + 0.6 + 0.6 + 0.6 + 0.6 = 4.8$$

Multiplication is easier.

Since $\begin{array}{r} 6 \\ 8 \\ \hline 48 \end{array}$ and 0.6 is less than 1, and 1 × 8 = 8, then 0.6 × 8 must be less than 8 $\begin{array}{r} 0.6 \\ 8 \\ \hline 4.8 \end{array}$

IN ACTION

1. Multiply.

a) $\begin{array}{r} 7 \\ 4 \\ \hline \end{array}$ $\begin{array}{r} 0.7 \\ 4 \\ \hline \end{array}$ b) $\begin{array}{r} 6 \\ 7 \\ \hline \end{array}$ $\begin{array}{r} 0.6 \\ 7 \\ \hline \end{array}$ c) $\begin{array}{r} 5 \\ 8 \\ \hline \end{array}$ $\begin{array}{r} 0.5 \\ 8 \\ \hline \end{array}$ d) $\begin{array}{r} 7 \\ 3 \\ \hline \end{array}$ $\begin{array}{r} 0.7 \\ 3 \\ \hline \end{array}$

e) $\begin{array}{r} 3 \\ 8 \\ \hline \end{array}$ $\begin{array}{r} 0.3 \\ 8 \\ \hline \end{array}$ f) $\begin{array}{r} 4 \\ 9 \\ \hline \end{array}$ $\begin{array}{r} 0.4 \\ 9 \\ \hline \end{array}$ g) $\begin{array}{r} 8 \\ 6 \\ \hline \end{array}$ $\begin{array}{r} 0.8 \\ 6 \\ \hline \end{array}$ h) $\begin{array}{r} 9 \\ 7 \\ \hline \end{array}$ $\begin{array}{r} 0.9 \\ 7 \\ \hline \end{array}$

2. Multiply.

a) $\begin{array}{r} 0.4 \\ 3 \\ \hline \end{array}$ b) $\begin{array}{r} 0.1 \\ 8 \\ \hline \end{array}$ c) $\begin{array}{r} 0.2 \\ 9 \\ \hline \end{array}$ d) $\begin{array}{r} 0.7 \\ 7 \\ \hline \end{array}$ e) $\begin{array}{r} 0.9 \\ 4 \\ \hline \end{array}$ f) $\begin{array}{r} 0.5 \\ 9 \\ \hline \end{array}$

g) $\begin{array}{r} 0.6 \\ 5 \\ \hline \end{array}$ h) $\begin{array}{r} 0.3 \\ 7 \\ \hline \end{array}$ i) $\begin{array}{r} 0.4 \\ 8 \\ \hline \end{array}$ j) $\begin{array}{r} 0.6 \\ 9 \\ \hline \end{array}$ k) $\begin{array}{r} 0.9 \\ 8 \\ \hline \end{array}$ l) $\begin{array}{r} 0.8 \\ 7 \\ \hline \end{array}$

3. Find the products.

a) 0.1 × 8 b) 0.7 × 3 c) 0.8 × 5 d) 0.9 × 6 e) 0.6 × 4
f) 0.5 × 6 g) 0.8 × 7 h) 0.7 × 4 i) 0.4 × 8 j) 0.6 × 7

4. The covered wagon train went 4.7 km in 1 hour.
How far would it travel in 10 hours?

EXPLORE

Multiplication / I Factor a Decimal

Find 7.8 × 6.

$$\begin{array}{r} 7.8 \\ \underline{\quad 6} \\ 46.8 \end{array}$$

Think	Record
48	8
42, 46	46

Since $7 \times 6 = 42$
and $8 \times 6 = 48$,
then 7.8×6 is greater than 42 and less than 48.
Place the decimal point as shown.

IN ACTION

1. Find the products. Estimate to place the decimal point.

a) $\begin{array}{r} 4.3 \\ \underline{\quad 5} \end{array}$ $\begin{array}{l} 4 \times 5 = ? \\ 5 \times 5 = ? \end{array}$

b) $\begin{array}{r} 7.6 \\ \underline{\quad 4} \end{array}$ $\begin{array}{l} 7 \times 4 = ? \\ 8 \times 4 = ? \end{array}$

c) $\begin{array}{r} 6.8 \\ \underline{\quad 3} \end{array}$ $\begin{array}{l} 6 \times 3 = ? \\ 7 \times 3 = ? \end{array}$

d) $\begin{array}{r} 5.7 \\ \underline{\quad 6} \end{array}$ $\begin{array}{l} 5 \times 6 = ? \\ 6 \times 6 = ? \end{array}$

e) $\begin{array}{r} 8.4 \\ \underline{\quad 7} \end{array}$ $\begin{array}{l} 8 \times 7 = ? \\ 9 \times 7 = ? \end{array}$

f) $\begin{array}{r} 9.2 \\ \underline{\quad 8} \end{array}$ $\begin{array}{l} 9 \times 8 = ? \\ 10 \times 8 = ? \end{array}$

2. Multiply.

a) $\begin{array}{r} 8.2 \\ \underline{\quad 6} \end{array}$ b) $\begin{array}{r} 7.4 \\ \underline{\quad 5} \end{array}$ c) $\begin{array}{r} 3.6 \\ \underline{\quad 4} \end{array}$ d) $\begin{array}{r} 5.1 \\ \underline{\quad 9} \end{array}$ e) $\begin{array}{r} 8.3 \\ \underline{\quad 7} \end{array}$ f) $\begin{array}{r} 9.4 \\ \underline{\quad 8} \end{array}$

g) $\begin{array}{r} 3.9 \\ \underline{\quad 3} \end{array}$ h) $\begin{array}{r} 4.8 \\ \underline{\quad 7} \end{array}$ i) $\begin{array}{r} 8.5 \\ \underline{\quad 9} \end{array}$ j) $\begin{array}{r} 9.7 \\ \underline{\quad 6} \end{array}$ k) $\begin{array}{r} 6.8 \\ \underline{\quad 5} \end{array}$ l) $\begin{array}{r} 7.8 \\ \underline{\quad 9} \end{array}$

3. Find the perimeters of the squares. Each side is :
a) 6.9 cm b) 7.8 cm c) 8.4 cm d) 4.9 cm e) 5.7 cm

4. A regular hexagon has 6 equal sides.
Find the perimeters of the regular hexagons. Each side is :
a) 4.6 cm b) 3.8 cm c) 9.4 cm d) 8.5 cm e) 7.9 cm

EXPLORE

Multiplication / I Factor a Decimal

Find 27.6 × 9.

$$\begin{array}{r} 27.6 \\ 9 \\ \hline 248.4 \end{array}$$

Think	Record
54	4
63, 68	8
18, 24	24

Since 27.6 is about 30,
then 27.6 × 9 is about 30 × 9 or 270.

Place the decimal point
as shown.

IN ACTION

1. Multiply.

a) $\begin{array}{r} 33.5 \\ 4 \\ \hline \end{array}$ b) $\begin{array}{r} 27.6 \\ 2 \\ \hline \end{array}$ c) $\begin{array}{r} 43.8 \\ 5 \\ \hline \end{array}$ d) $\begin{array}{r} 54.7 \\ 3 \\ \hline \end{array}$ e) $\begin{array}{r} 63.9 \\ 4 \\ \hline \end{array}$ f) $\begin{array}{r} 72.8 \\ 8 \\ \hline \end{array}$

g) $\begin{array}{r} 85.3 \\ 6 \\ \hline \end{array}$ h) $\begin{array}{r} 74.9 \\ 7 \\ \hline \end{array}$ i) $\begin{array}{r} 92.8 \\ 5 \\ \hline \end{array}$ j) $\begin{array}{r} 38.9 \\ 8 \\ \hline \end{array}$ k) $\begin{array}{r} 91.8 \\ 7 \\ \hline \end{array}$ l) $\begin{array}{r} 89.4 \\ 9 \\ \hline \end{array}$

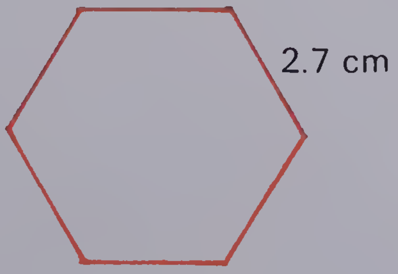
2. Find the products.

a) 29.5 × 7 b) 34.6 × 4 c) 45.7 × 3 d) 51.8 × 2 e) 63.7 × 6
f) 76.8 × 5 g) 56.4 × 8 h) 49.8 × 7 i) 73.9 × 6 j) 84.5 × 4
k) 93.7 × 4 l) 82.7 × 9

3. Each side of a regular pentagon is the same length.
If each side is 3.8 cm, what is the perimeter of the pentagon?

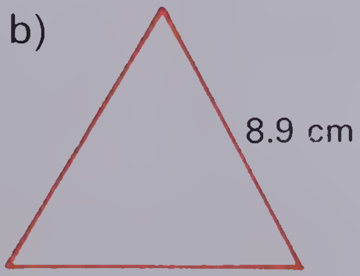
4. Find the perimeter of each figure.

a)



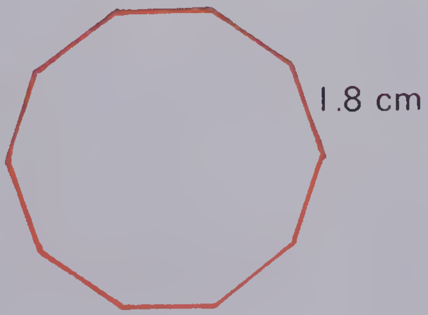
regular hexagon

b)

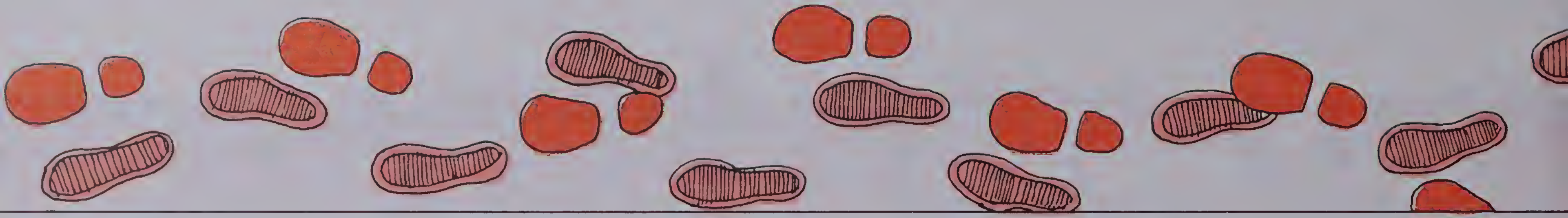


equilateral triangle

c)



regular decagon



Retrace Your Steps

A decimal by 10

0.4 × 10 = 4
3.4 × 10 = 34
23.4 × 10 = 234

A 1-decimal factor by a 1-digit factor

7 × 8 = 56
0.7 × 8 = 5.6

A decimal by a 1-digit factor

$$\begin{array}{r} 3.6 \\ 9 \\ \hline 32.4 \end{array} \qquad \begin{array}{r} 23.6 \\ 9 \\ \hline 212.4 \end{array}$$

IN ACTION

1. Find the products.

a) 0.5 × 10
4.5 × 10
24.5 × 10

b) 0.7 × 10
1.7 × 10
11.7 × 10

c) 0.2 × 10
9.2 × 10
29.2 × 10

d) 0.8 × 10
4.8 × 10
34.8 × 10

e) 0.9 × 10
1.9 × 10
21.9 × 10

2. Find the products.

a) 0.3 × 5
b) 0.4 × 6
c) 0.2 × 8
d) 0.6 × 7
e) 0.8 × 4
f) 0.7 × 2
g) 0.8 × 7
h) 0.5 × 7
i) 0.9 × 3
j) 0.9 × 8

3. Multiply.

a) $\begin{array}{r} 3.2 \\ 4 \\ \hline \end{array}$
b) $\begin{array}{r} 4.7 \\ 6 \\ \hline \end{array}$
c) $\begin{array}{r} 6.1 \\ 9 \\ \hline \end{array}$
d) $\begin{array}{r} 7.3 \\ 5 \\ \hline \end{array}$
e) $\begin{array}{r} 8.2 \\ 9 \\ \hline \end{array}$
f) $\begin{array}{r} 4.7 \\ 3 \\ \hline \end{array}$
g) $\begin{array}{r} 7.8 \\ 2 \\ \hline \end{array}$
h) $\begin{array}{r} 4.9 \\ 4 \\ \hline \end{array}$
i) $\begin{array}{r} 3.8 \\ 6 \\ \hline \end{array}$
j) $\begin{array}{r} 8.7 \\ 5 \\ \hline \end{array}$
k) $\begin{array}{r} 9.3 \\ 8 \\ \hline \end{array}$
l) $\begin{array}{r} 7.8 \\ 9 \\ \hline \end{array}$

4. Multiply.

a) $\begin{array}{r} 12.4 \\ 3 \\ \hline \end{array}$
b) $\begin{array}{r} 21.5 \\ 4 \\ \hline \end{array}$
c) $\begin{array}{r} 37.2 \\ 6 \\ \hline \end{array}$
d) $\begin{array}{r} 24.9 \\ 5 \\ \hline \end{array}$
e) $\begin{array}{r} 35.8 \\ 7 \\ \hline \end{array}$
f) $\begin{array}{r} 19.6 \\ 8 \\ \hline \end{array}$
g) $\begin{array}{r} 47.3 \\ 8 \\ \hline \end{array}$
h) $\begin{array}{r} 73.8 \\ 6 \\ \hline \end{array}$
i) $\begin{array}{r} 84.7 \\ 3 \\ \hline \end{array}$
j) $\begin{array}{r} 97.6 \\ 4 \\ \hline \end{array}$

Dividing a Decimal by 10

Study the patterns.

100 ÷ 10 = 10
10 ÷ 10 = 1
1 ÷ 10 = 0.1

80 ÷ 10 = 8
8 ÷ 10 = 0.8
0.8 ÷ 10 = 0.08

270 ÷ 10 = 27
27 ÷ 10 = 2.7
2.7 ÷ 10 = 0.27

3560 ÷ 10 = 356
356 ÷ 10 = 35.6
35.6 ÷ 10 = 3.56

IN ACTION

1. Complete the patterns.

a) 200 ÷ 10 = ?
20 ÷ 10 = ?
2 ÷ 10 = ?

b) 500 ÷ 10 = ?
50 ÷ 10 = ?
5 ÷ 10 = ?

c) 900 ÷ 10 = ?
90 ÷ 10 = ?
9 ÷ 10 = ?

d) 1000 ÷ 10 = ?
100 ÷ 10 = ?
10 ÷ 10 = ?

e) 150 ÷ 10 = ?
15 ÷ 10 = ?
1.5 ÷ 10 = ?

f) 360 ÷ 10 = ?
36 ÷ 10 = ?
3.6 ÷ 10 = ?

g) 780 ÷ 10 = ?
78 ÷ 10 = ?
7.8 ÷ 10 = ?

h) 990 ÷ 10 = ?
99 ÷ 10 = ?
9.9 ÷ 10 = ?

i) 7900 ÷ 10 = ?
790 ÷ 10 = ?
79 ÷ 10 = ?

j) 9400 ÷ 10 = ?
940 ÷ 10 = ?
94 ÷ 10 = ?

k) 2780 ÷ 10 = ?
278 ÷ 10 = ?
27.8 ÷ 10 = ?

l) 5240 ÷ 10 = ?
524 ÷ 10 = ?
52.4 ÷ 10 = ?

2. Divide the first number by the second number.

a) (20, 10) b) (60, 10) c) (7, 10) d) (9, 10) e) (5, 10) f) (1, 10)
g) (30, 10) h) (28, 10) i) (31, 10) j) (47, 10) k) (83, 10) l) (99, 10)
m) (350, 10) n) (275, 10) o) (189, 10) p) (265, 10) q) (824, 10) r) (769, 10)

3. Solve.

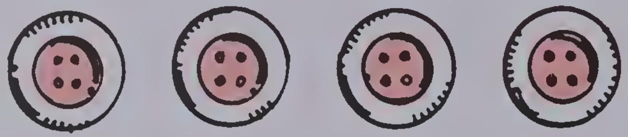
a) $k = 3.6 \div 10$ b) $p = 2.4 \div 10$ c) $r = 7.8 \div 10$ d) $w = 5.8 \div 10$
e) $v = 9.9 \div 10$ f) $u = 24.8 \div 10$ g) $y = 39.2 \div 10$ h) $n = 71.1 \div 10$
i) $m = 87.6 \div 10$ j) $q = 89.9 \div 10$

4. How many centimetres?

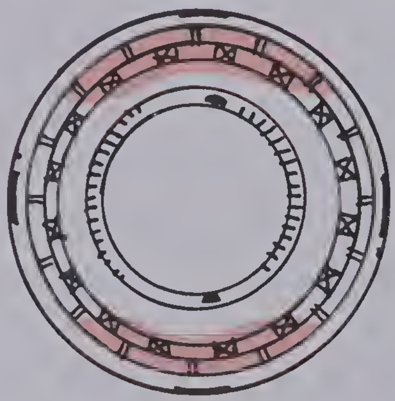
a) 100 mm b) 10 mm c) 1 mm d) 8 mm e) 12 mm f) 24 mm
g) 37 mm h) 65 mm i) 75 mm j) 88 mm k) 91 mm l) 90 mm

EXPLORE

Congruence



What do you notice about the buttons on your jacket?
They are the same size and the same shape.
Why do you think buttons on a piece of clothing
are the same size and same shape?



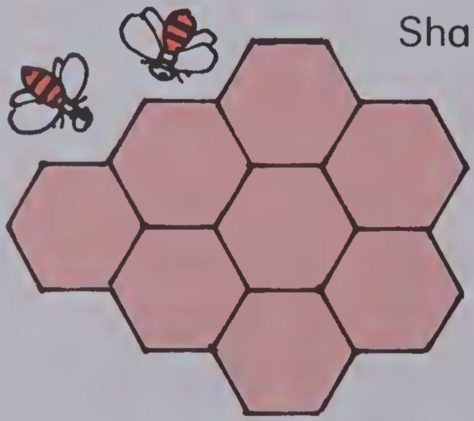
What do you notice about dinner plates on the table?

They are the same size and same shape.

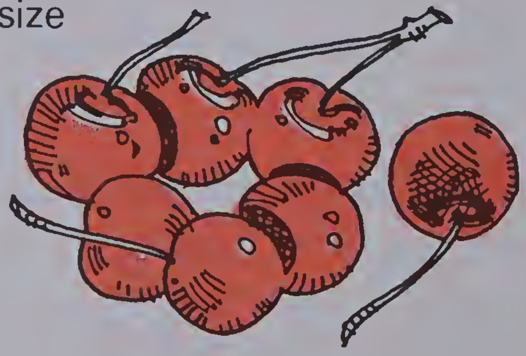
What other dishes in the set match in the same way?

Why do you think dishes are made that way?

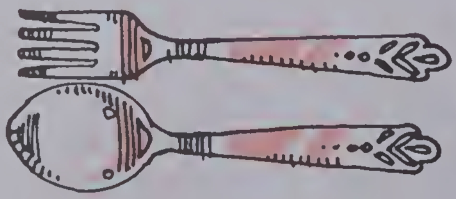
Nature often makes things the same size and same shape.

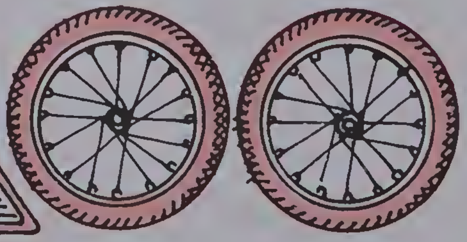


Shapes that are the same size
and same shape
are **congruent**.

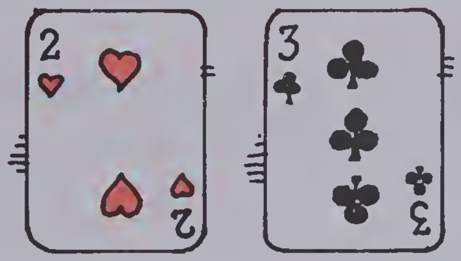


Make a list of things that are congruent.
Include some things from outdoors, some kitchen
things, and some things from your classroom.

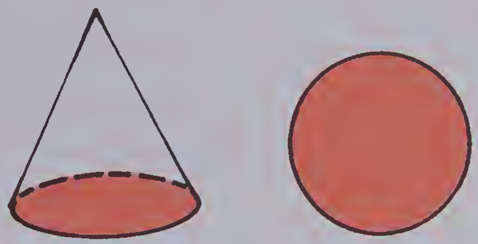




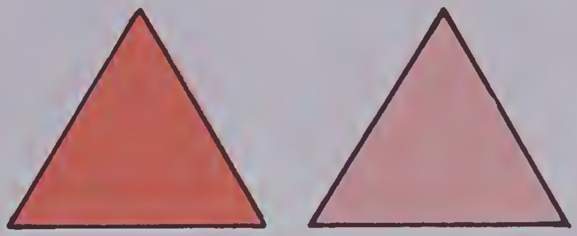
How can you tell if 2 playing cards
are congruent (same size, same shape)?



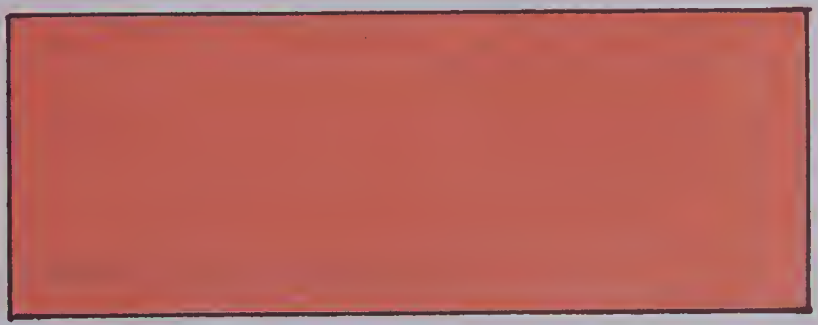
How can you tell if the base of this cone
is congruent to the circle?

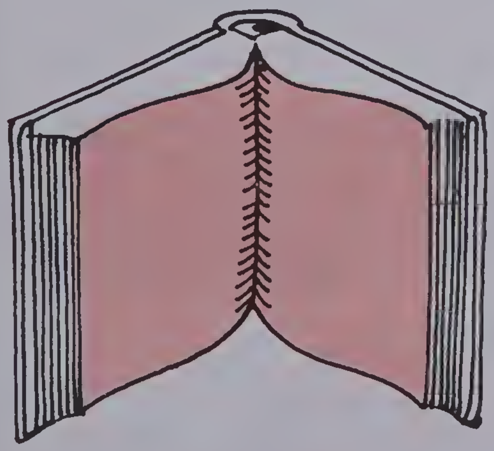


How can you tell if
the 2 triangles on the page are congruent?

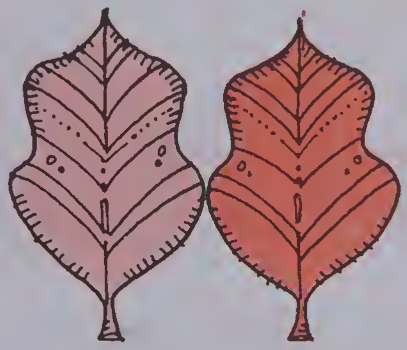


Test to see if this rectangle
is congruent to the large rectangle
on page 38.





Why are the pages
of a book congruent?

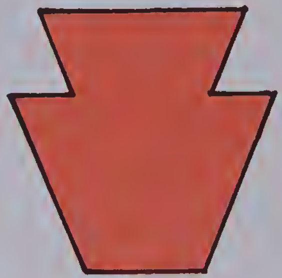


Can you find
2 congruent leaves?

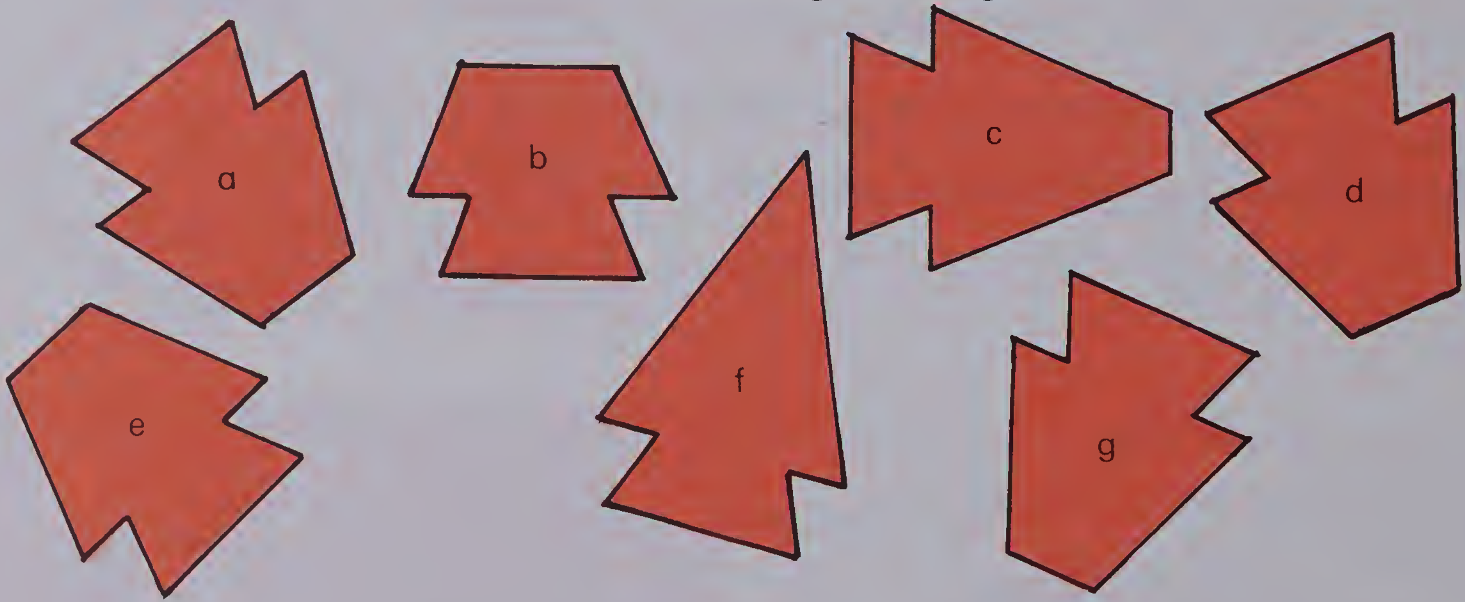
Is this line segment
congruent to one found on page 34?

IN ACTION

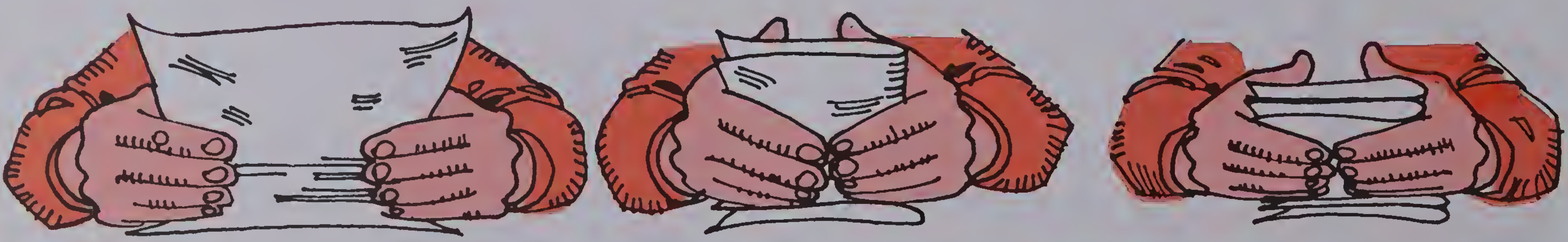
1. Trace this shape and cut it out.



Use your shape to tell
which of the following are congruent.

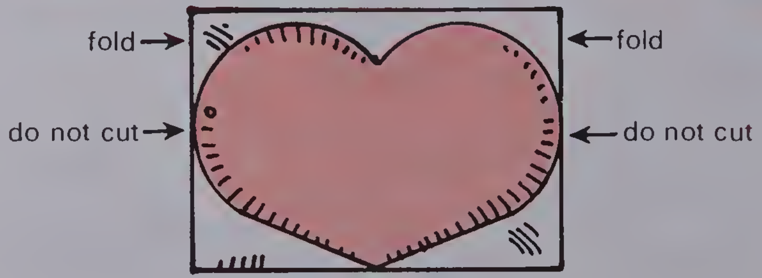


2. Get a piece of paper about 40 cm long and 10 cm wide.
Fold it as shown.



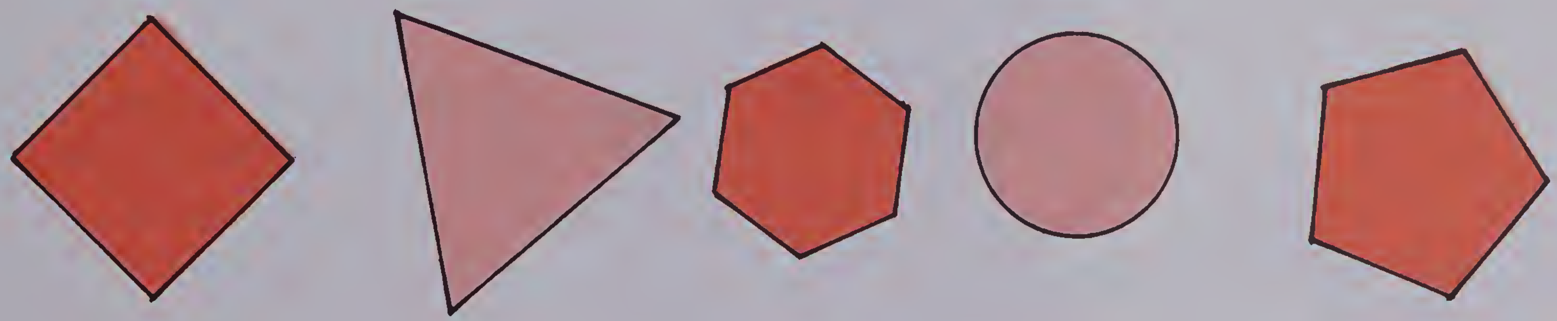
After you have made the last fold,
sketch and cut out the shape.

Open your cutting.
What can you say about each heart?

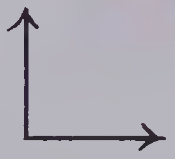

fold
fold
do not cut
do not cut

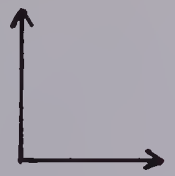
3. Cut out an interesting shape from paper.
Trace around your shape in several different positions.
Is each tracing congruent to the original?

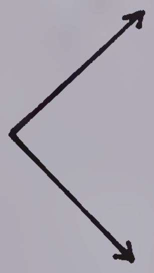
4. In your workbook,
draw shapes congruent to these.
You may use tracing paper to help.

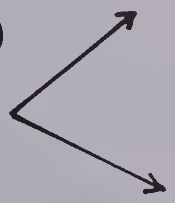


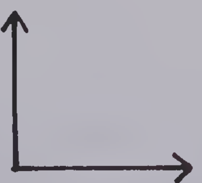
5. Which angles are congruent to this angle?

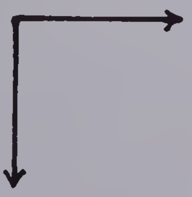


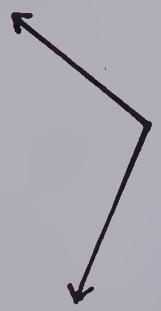
a) 

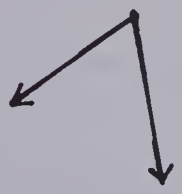
b) 

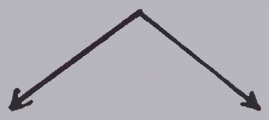
c) 

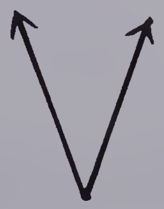
d) 

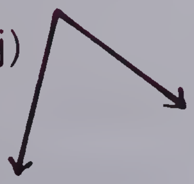
e) 

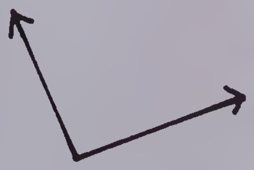
f) 

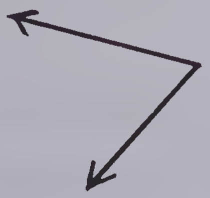
g) 

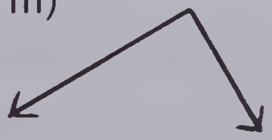
h) 

i) 

j) 

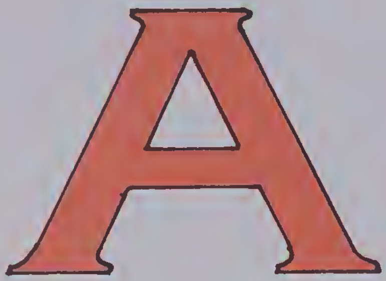
k) 

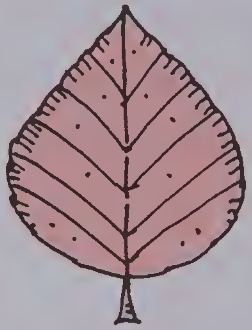
l) 

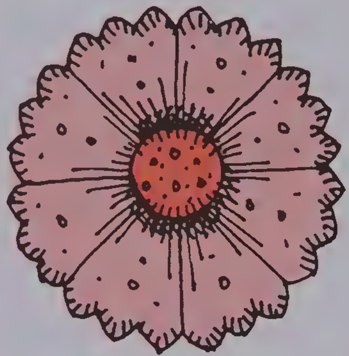
m) 

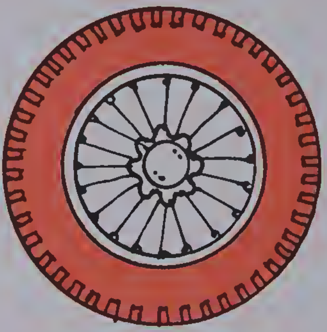
EXPLORE

Symmetry



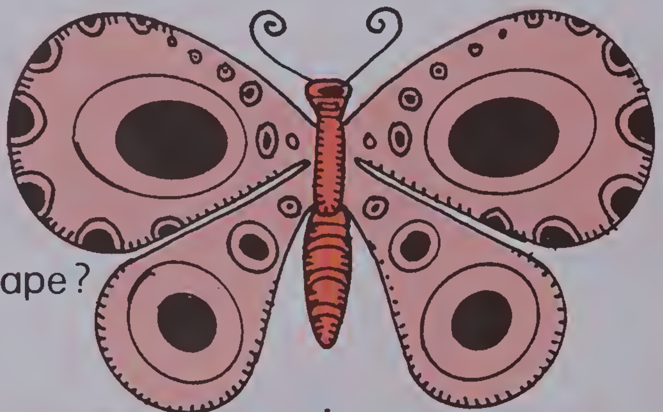






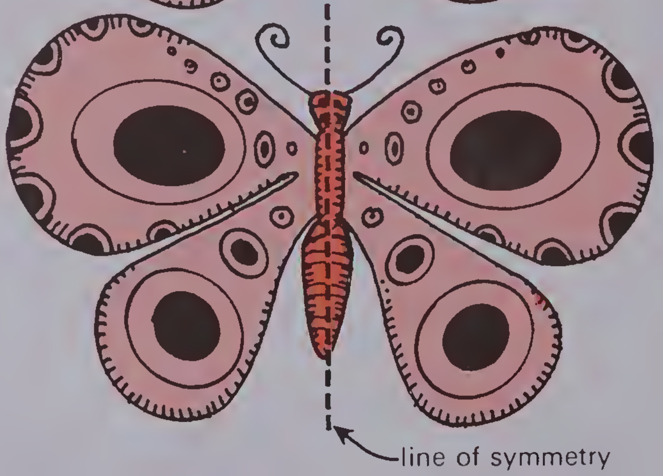
What is special about all these shapes?

What is special about this shape?



One-half of the shape
exactly matches the other half.
How can we tell that
the 2 sides match?

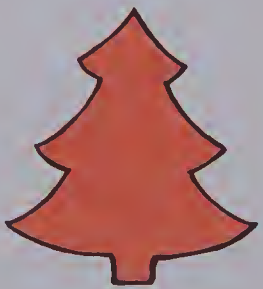
Trace and cut out the shape.
Fold it on the dotted line.
What do you discover?

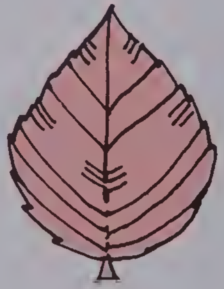


When 2 sides of a shape
match exactly,
the shape has **symmetry.**

The fold line is a **line of symmetry.**

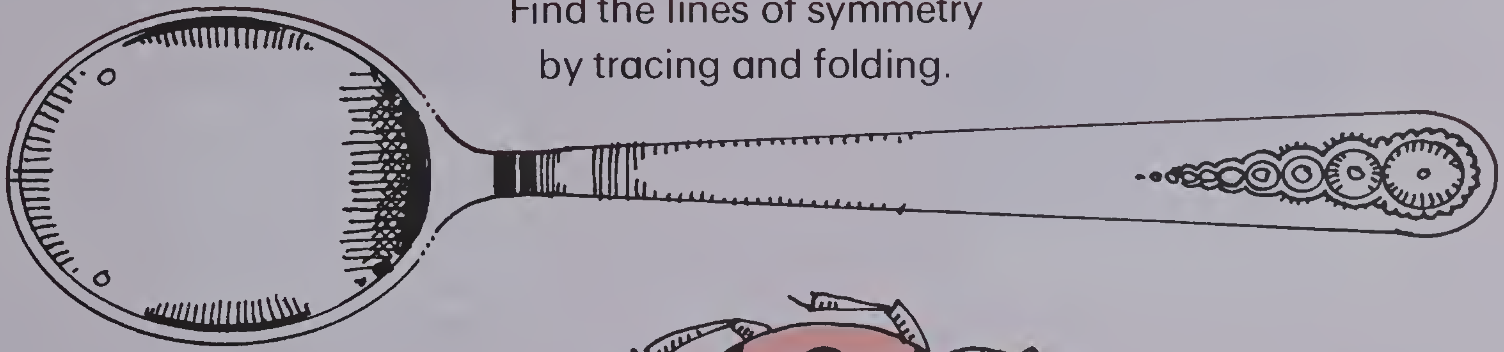
Trace and cut out this shape.
Fold it to find a line of symmetry.

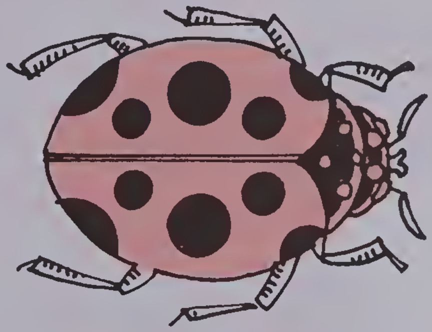


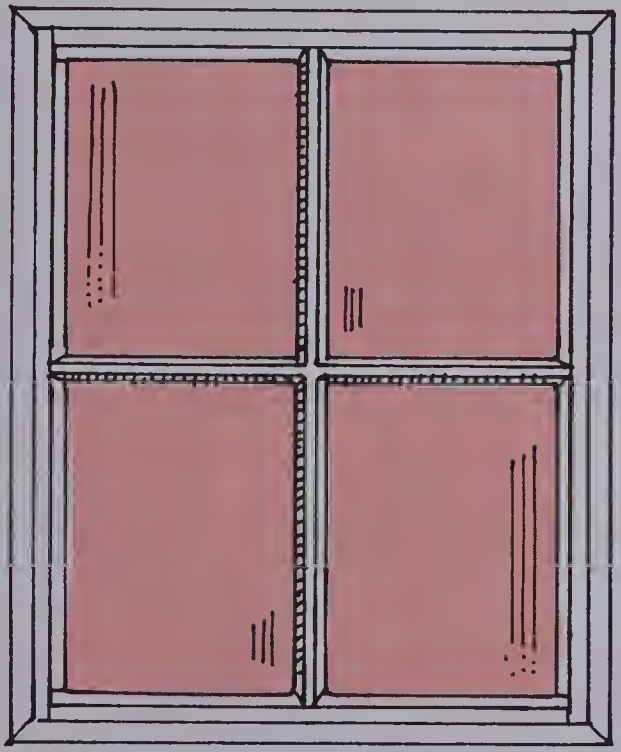


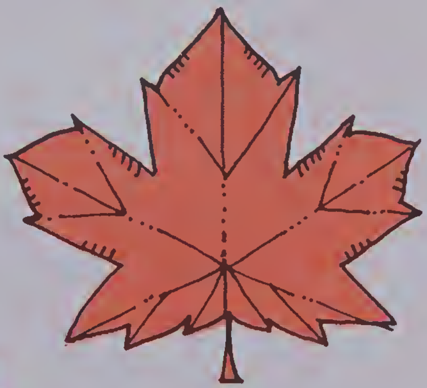
Do the same with this shape.

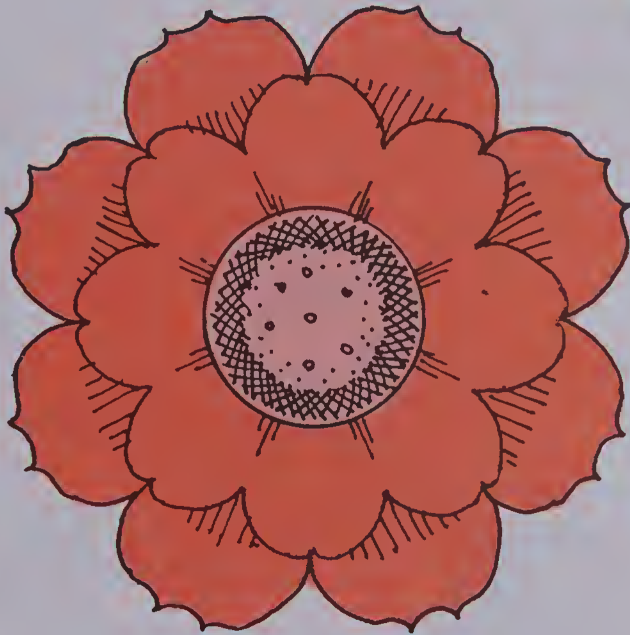
Find the lines of symmetry
by tracing and folding.

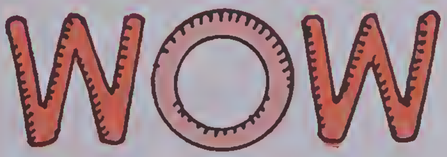








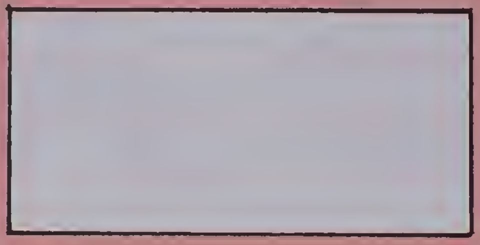




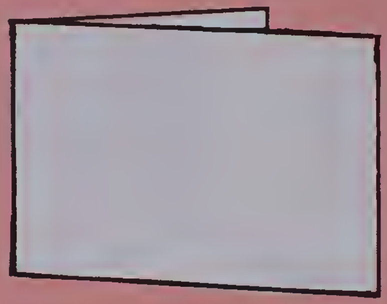
Many shapes in Nature are symmetric.
Can you name 5?

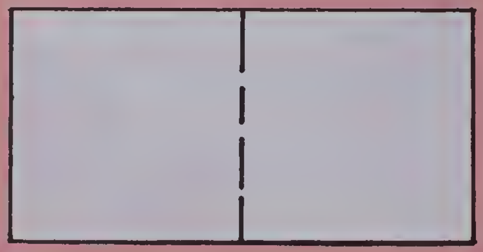
Many things made by people are also symmetric.
Can you name 5?

Sometimes shapes have more than
1 line of symmetry.
Cut out a rectangle.

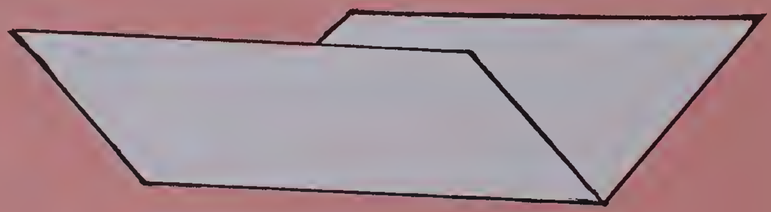


If you fold it like this,
both halves match exactly.

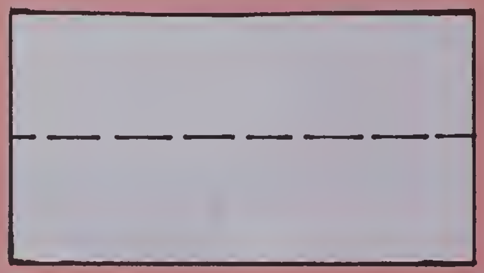




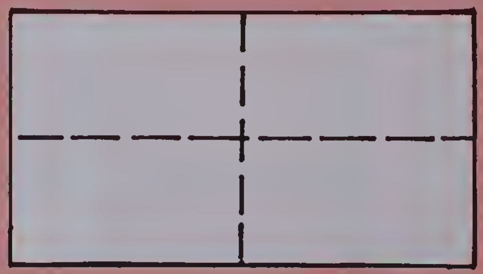
This is a line of symmetry.



If you fold it like this,
both halves match exactly.



This is a line of symmetry.



How many lines of symmetry
does this rectangle have?

Do other rectangles have 2 lines of symmetry?

Cut out and fold some rectangles to discover.

How many lines of symmetry has a square?
Fold a square to be sure you find all the lines
of symmetry.

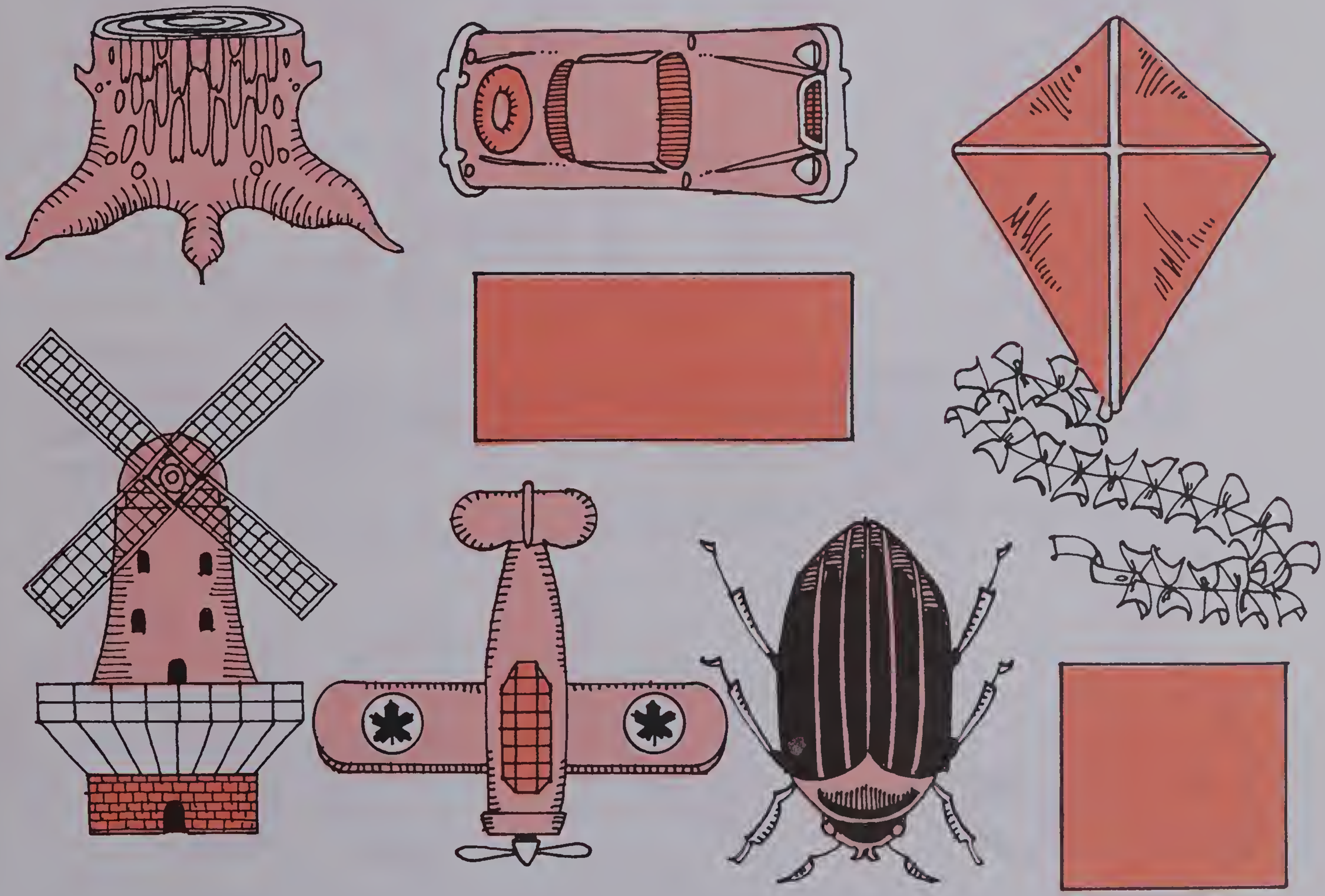
An ordinary mirror or a red plastic mirror can be helpful in finding lines of symmetry.

It saves tracing, cutting, and folding shapes.

Place the mirror on the shape.

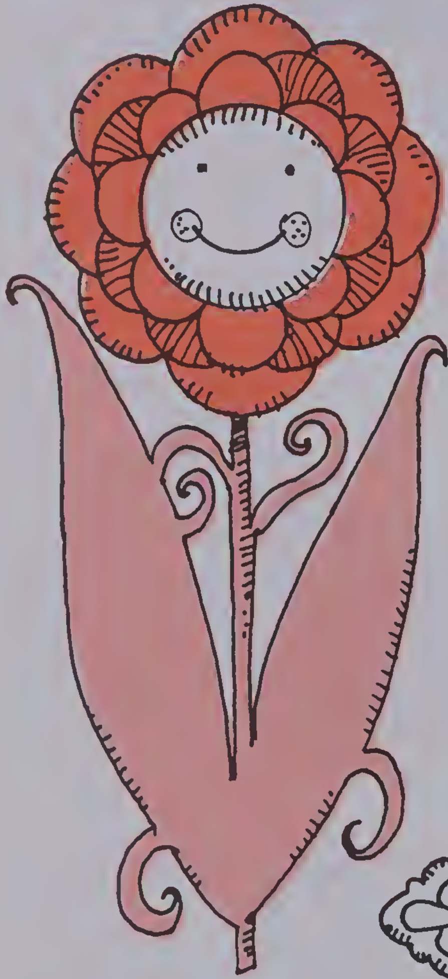
Move the mirror back and forth
until the image you see in the mirror
matches the shape on the page.

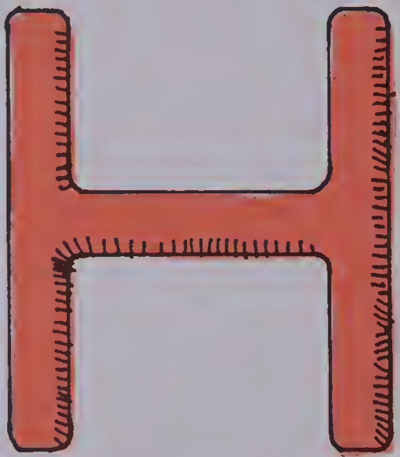
Draw the line of symmetry
by tracing along the edge of the mirror.

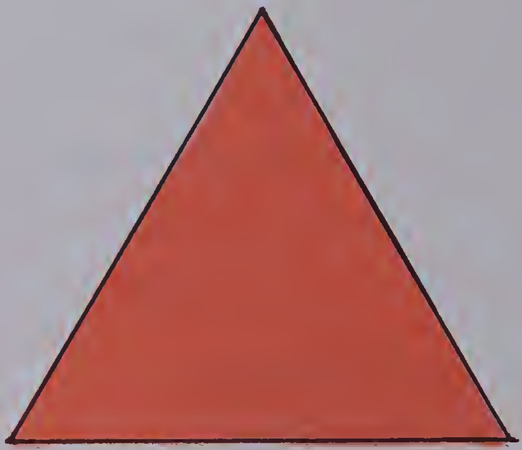


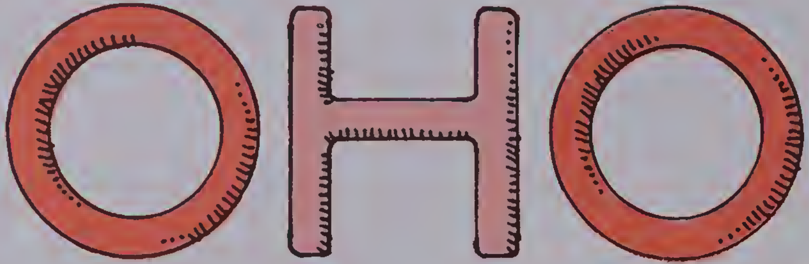
IN ACTION

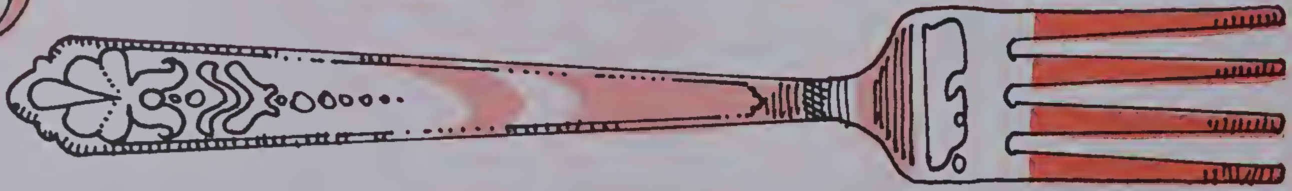
1. Trace each shape. Use a mirror or fold the shapes to help you discover all the lines of symmetry for each shape.



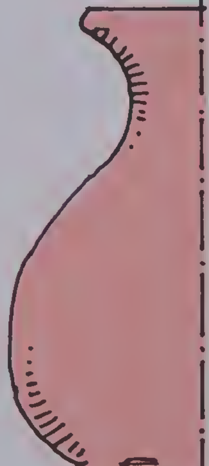


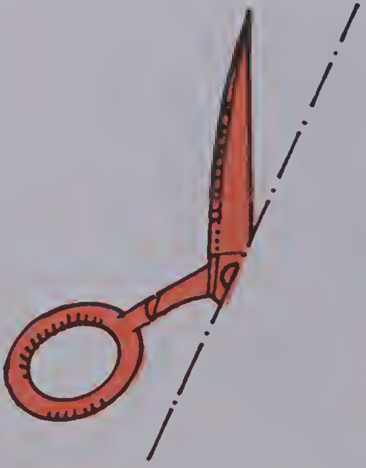


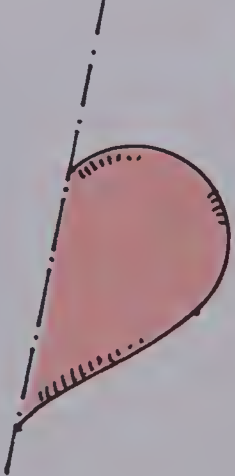


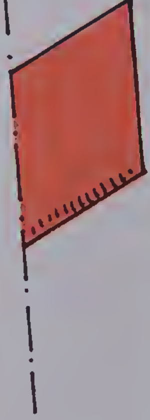


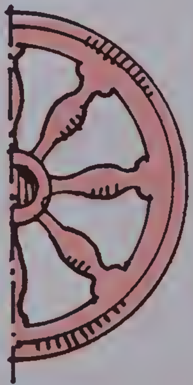
2. Trace each diagram, then complete the figure. Use a mirror to check your work.

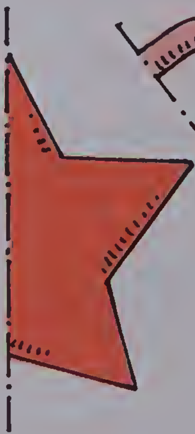


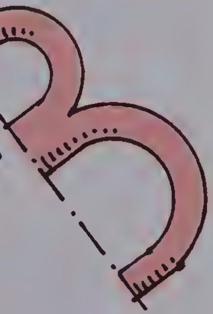






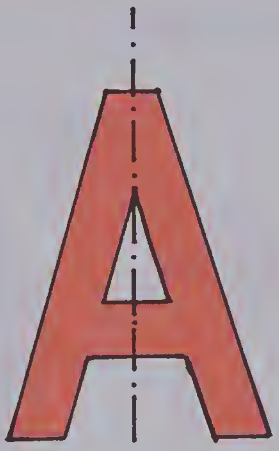






3. Trace these letters. Use a mirror to discover the lines of symmetry for each letter.

B D E I K M V T

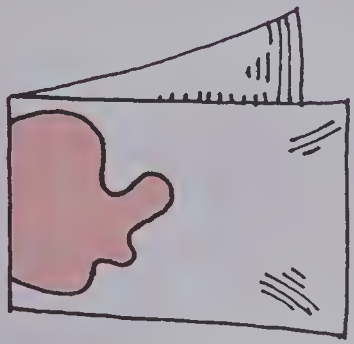


4. Several letters of the alphabet do not have any lines of symmetry. Can you name 5?

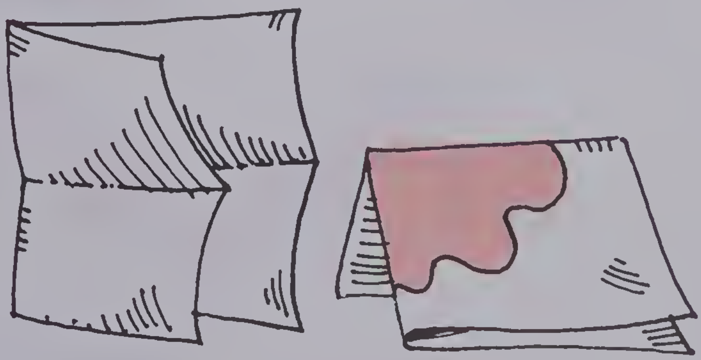
5. Some letters of the alphabet contain more than one line of symmetry. Can you name 2?

6. Print your name using capital letters.
   Draw all the lines of symmetry you can find.

7. a) Fold a piece of paper once.
   Draw a shape next to the fold.
   Cut out the shape.
   How many lines of symmetry does the shape have?



   b) Fold a piece of paper twice.
   Draw a shape so that it touches both folded edges.
   Cut out the shape. How many lines of symmetry does the shape have?

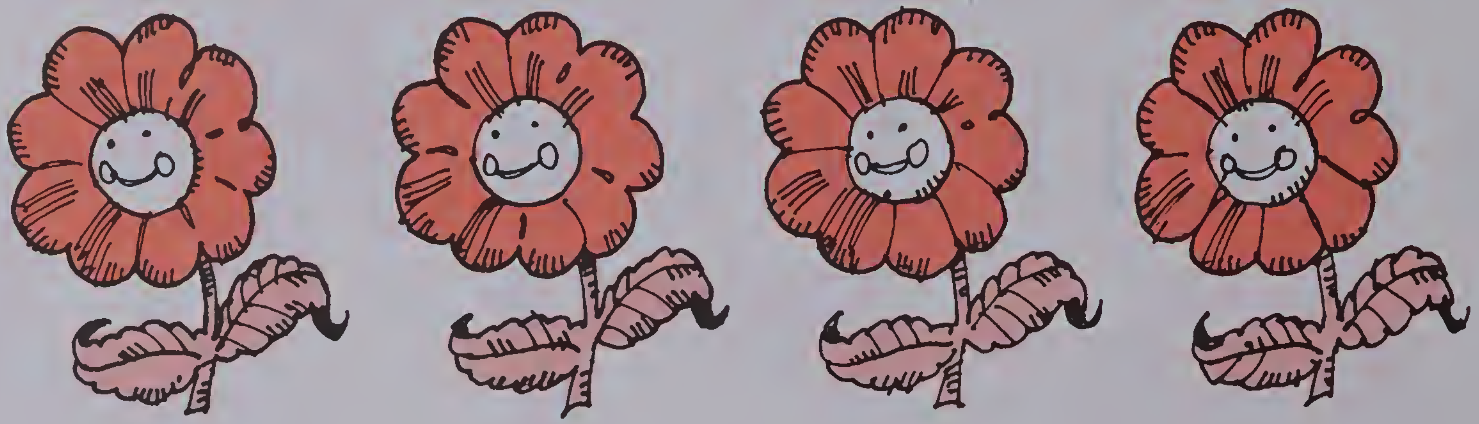


   c) Can you fold a piece of paper, draw, and cut out a shape with 3 lines of symmetry?

EXPLORE

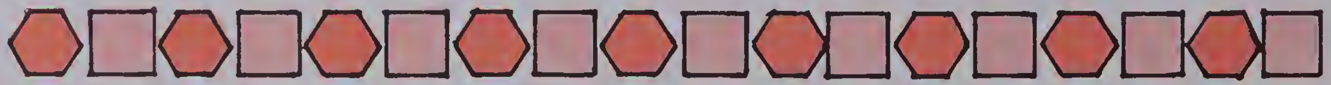
Motion Geometry

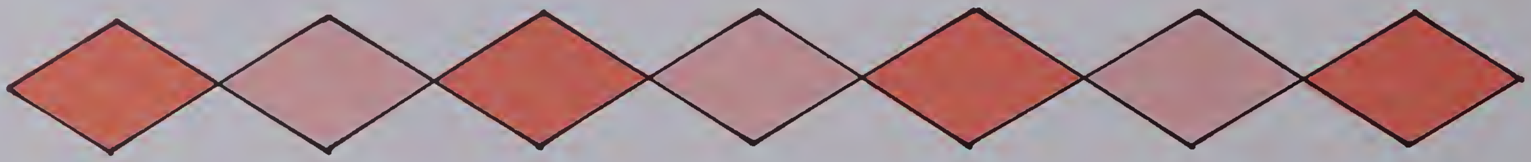
Everywhere we can find beautiful patterns.



One place to find patterns is in wallpaper.
Where else might you find patterns?

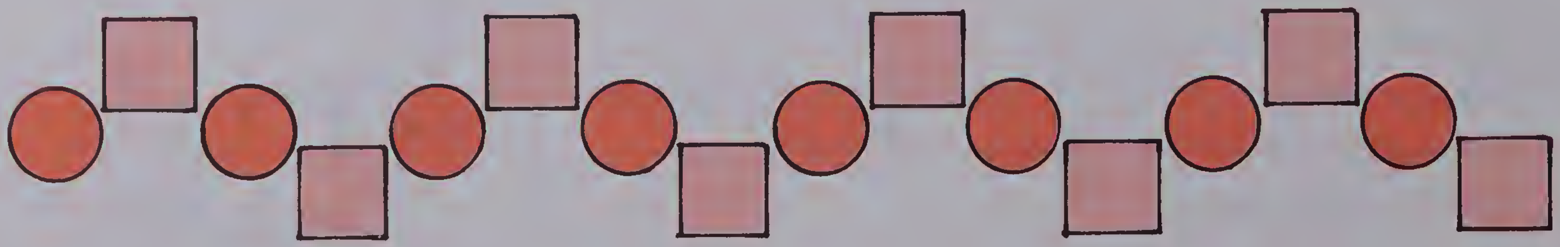
Sometimes patterns use just one shape like the one above.
Sometimes more than one shape is used.





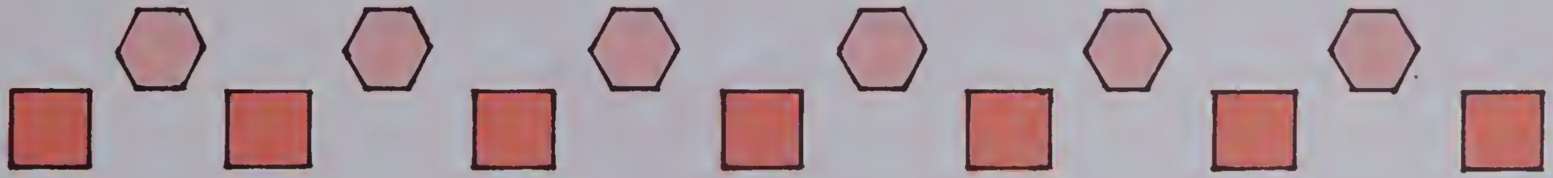
Colour often adds interest to patterns.

Patterns aren't always made in straight lines.

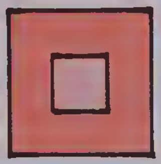


Patterns can be fun to look at and to create!
Make a collection of pictures to show how patterns are used.

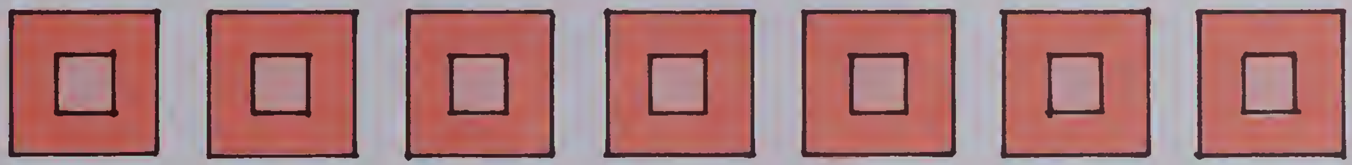
Slides



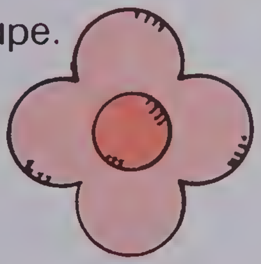
You can create patterns. Let's look at some first.
If you start with this shape,



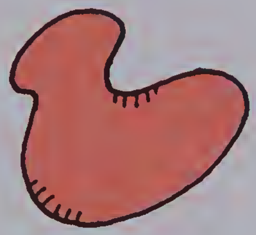
how do you move it to create this design?



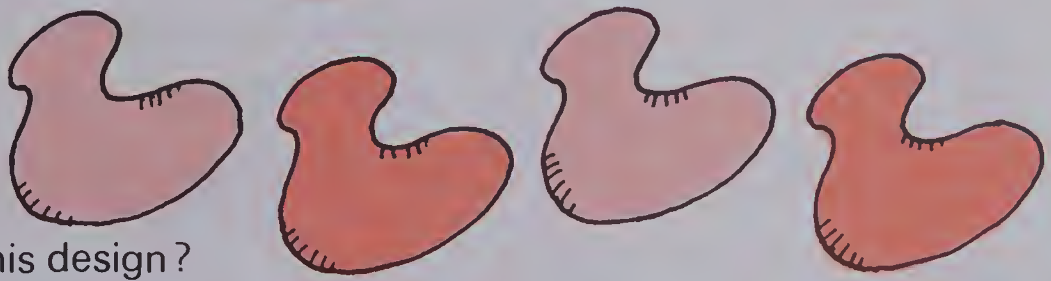
Trace and cut out this shape.
Use it to make a pattern
the same way the pattern
above was made.



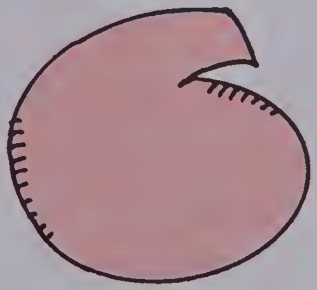
If you start with
this shape, how
do you move it to



create this design?



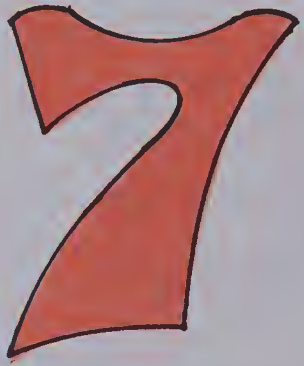
Trace and cut out this shape.



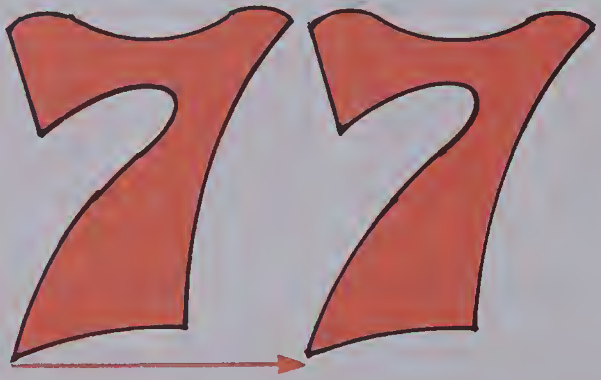
Use it to make a pattern in the same way as the pattern above was made.

IN ACTION

Trace and cut out this shape from cardboard.
Place the shape on a page of your notebook.



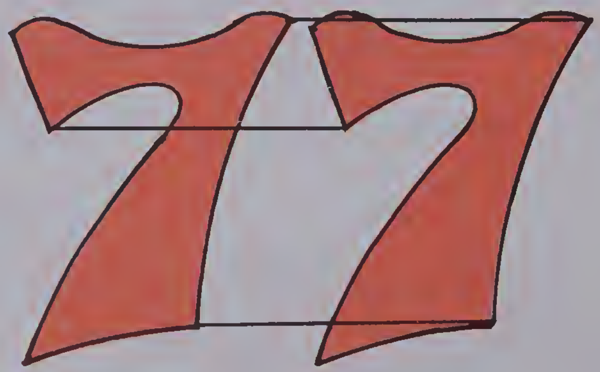
Trace around the shape.
Now "slide" the shape 3 cm to the right.



Trace around the shape again.

Keep on moving the shape 3 cm to the right each time and tracing it until you have a strip pattern.

What could your pattern be used for?

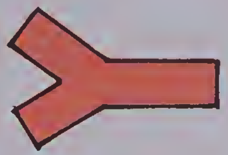


Join 2 like parts of neighbouring shapes in your pattern.
Measure the length of the line.
Draw 2 other lines, each of which joins like parts.
What can you discover about the length of each line?

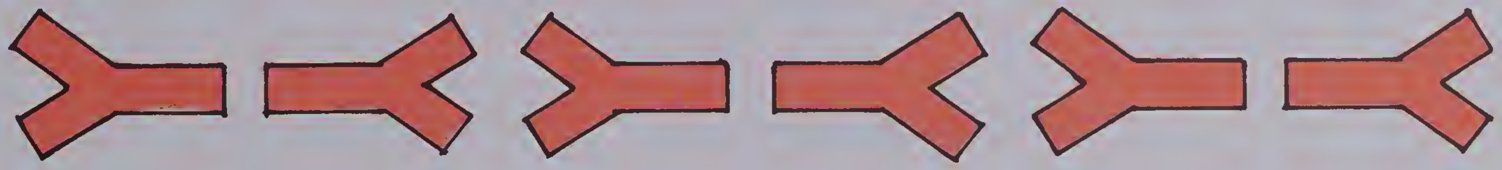
EXPLORE

Flips

Patterns can be made in different ways.
If you start with this shape,

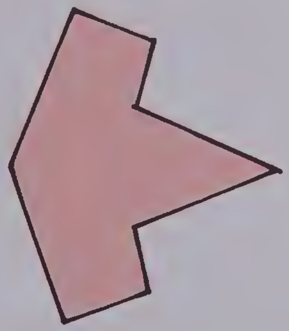


how do you create this design?

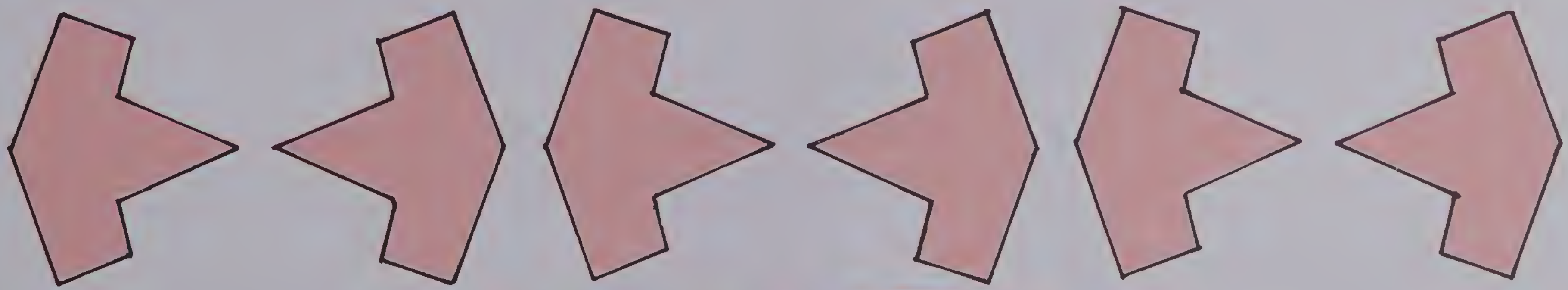


Patterns like this are very popular.

If you start with this shape,

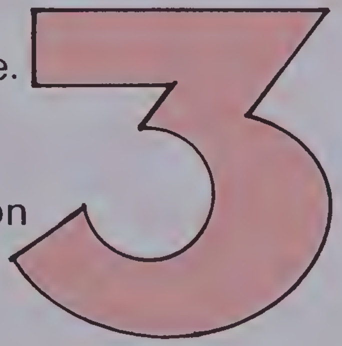


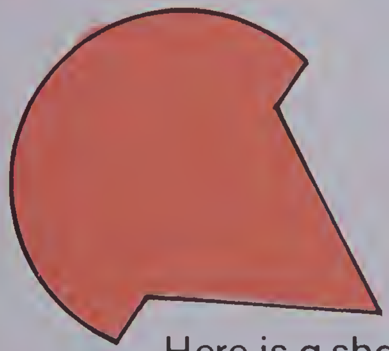
how do you create this design?



Trace and cut out this shape.

Use it to make a pattern
the same way the patterns on
this page have been made.

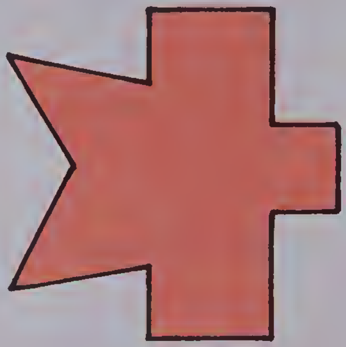




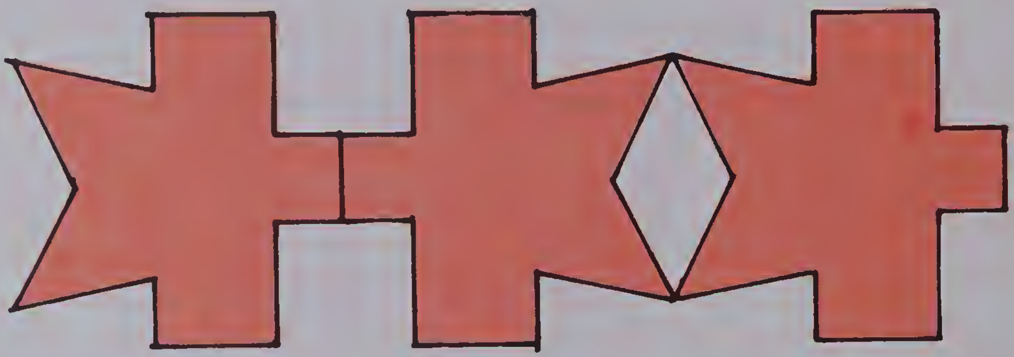
Here is a shape you may prefer to use.

IN ACTION

1. Trace and cut out this shape from cardboard.



Place the shape on a page of your notebook.

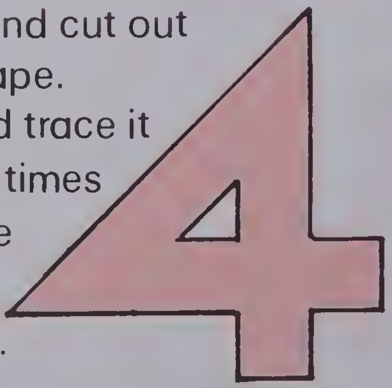


Trace around the shape.
Now "flip" the shape over.
Trace around the shape again.

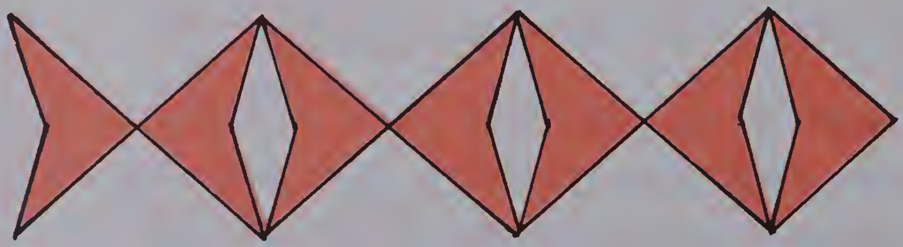
"Flip" the shape over and trace around it again.

Keep on "flipping" the shape and tracing around it until you have a strip pattern.

2. Trace and cut out this shape. Flip and trace it several times to make a strip pattern.



3. Trace the shape that has been used to make this pattern.

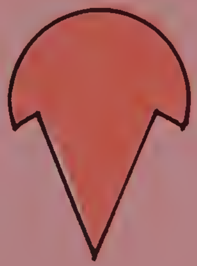


EXPLORE

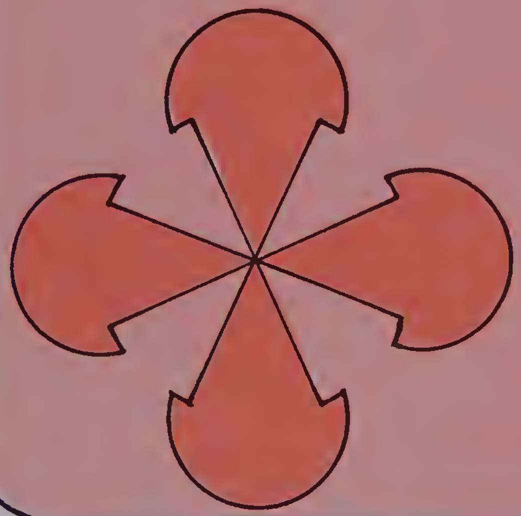
Turns

Here is still a different way to make patterns!

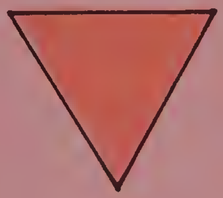
If you start with this shape,



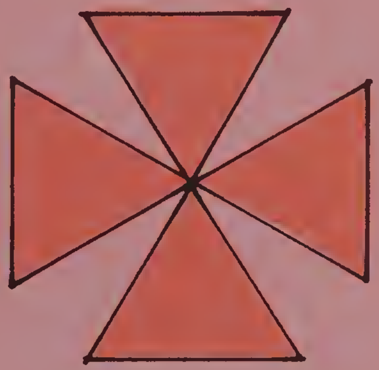
how do you move it
to create this design?



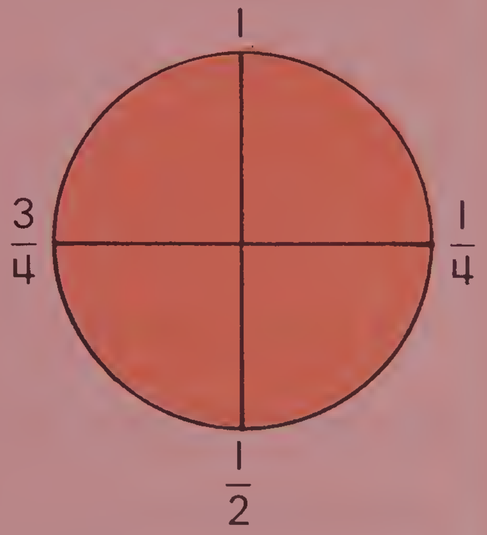
If you start with this shape,

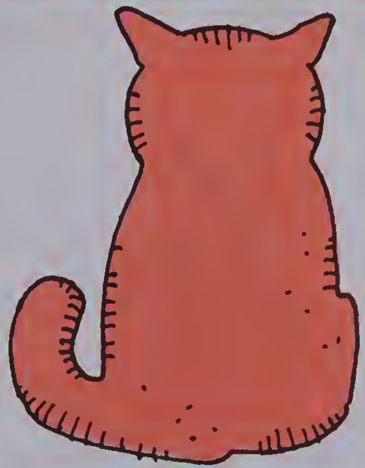


how do you move it
to create this design?



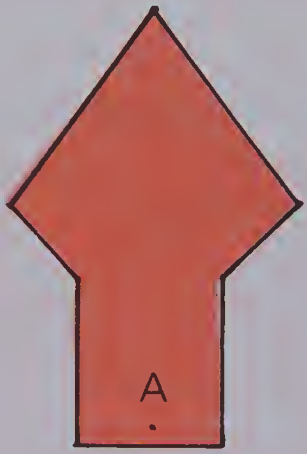
Can you relate
the way these patterns
are created
to this diagram?





Trace and cut out this shape.
Use it to make a pattern in the same
way as the patterns on this page have been made.

IN ACTION



1. Trace and cut out this shape from cardboard.

   Place the shape on a page of your notebook.

   Place a pin on the point A

   and turn the shape $\frac{1}{4}$ turn clockwise.

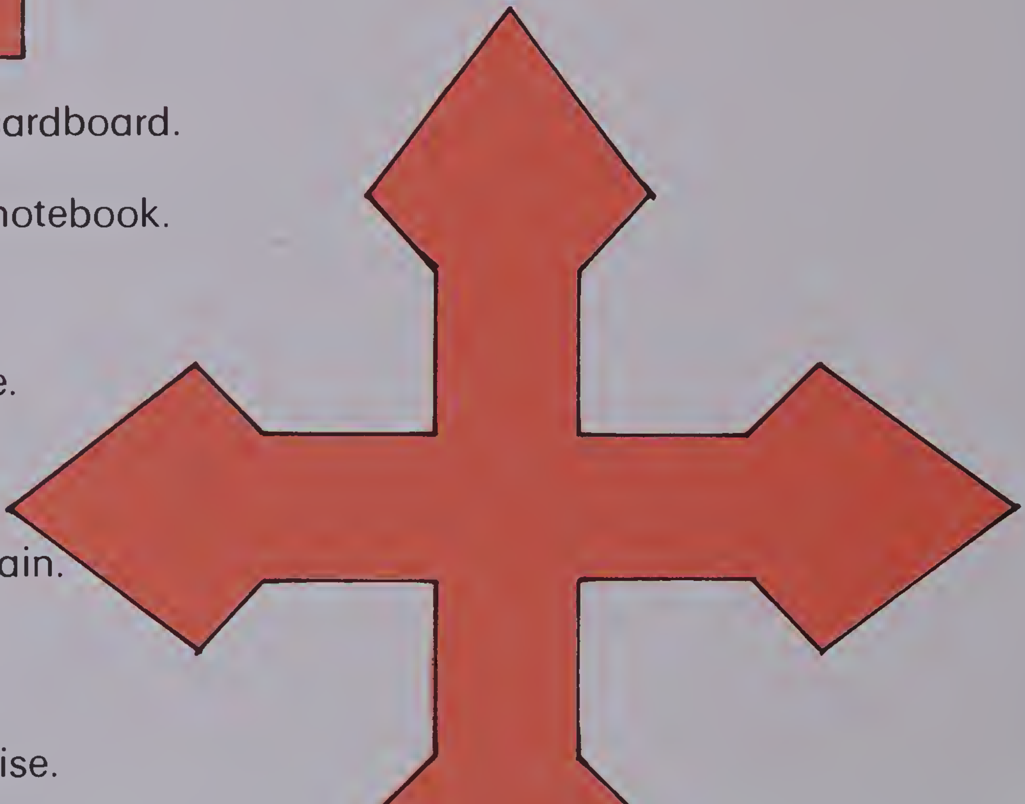
   Trace around the shape.

   Turn the shape $\frac{1}{4}$ turn clockwise again.

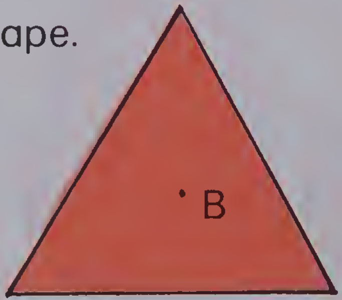
   Trace around the shape.

   Again turn the shape $\frac{1}{4}$ turn clockwise.

   Trace around the shape.



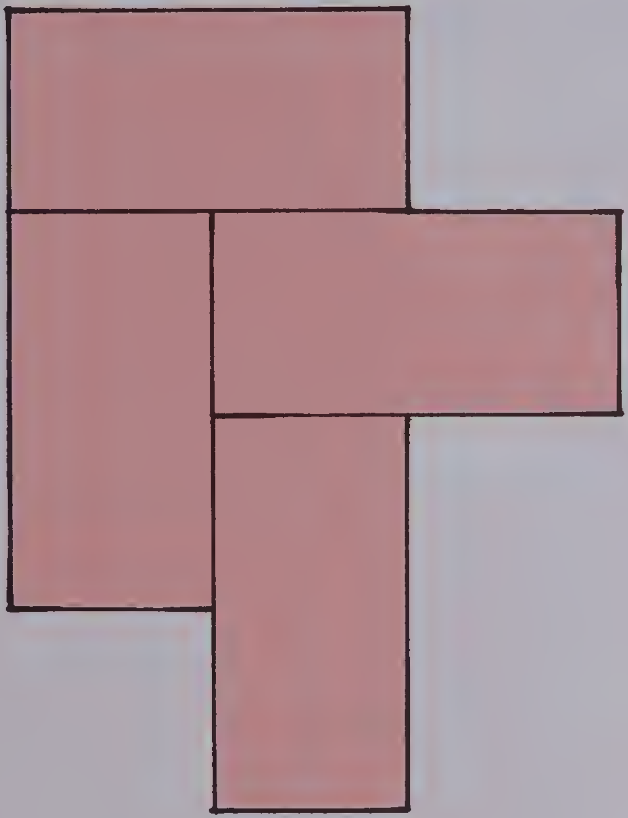
2. Trace and cut out a model of this shape.
   Use a pin and the point B
   to turn and trace the triangle
   through three $\frac{1}{4}$ turns clockwise.
   What pattern do you create?

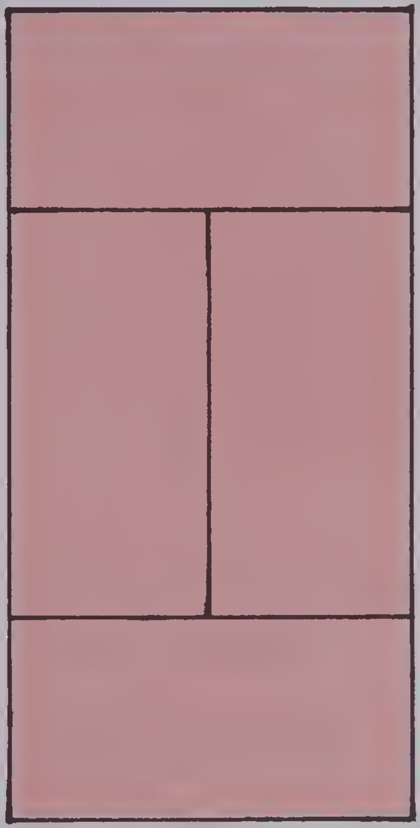


3. Cut out a shape of your own. Turn and trace it to make a design.

EXPLORE

Patterns





Study each pattern.
Trace 1 rectangle.

Tell how you moved the tracing to form each pattern.

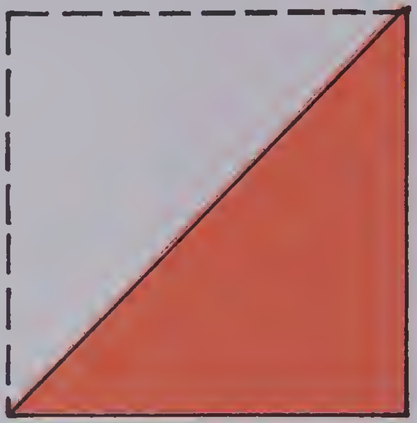
Copy and extend each pattern for 4 more entries.
Find the area of your tracing.
What is the area of each pattern?

What is the area of each complete pattern you made?

Can you make another pattern using the 4 rectangles?

Where have you seen these patterns used?

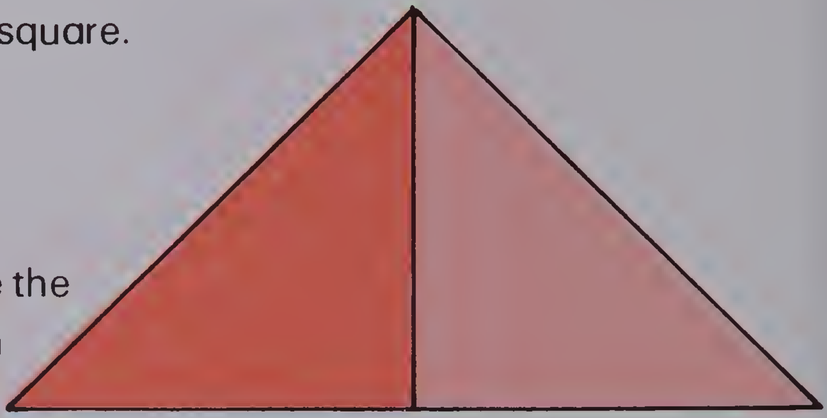
Trace this triangle.



Its area is $\frac{1}{2}$ the area of a square.

Its area is about 8 cm².

How did you move the tracing to form this pattern?



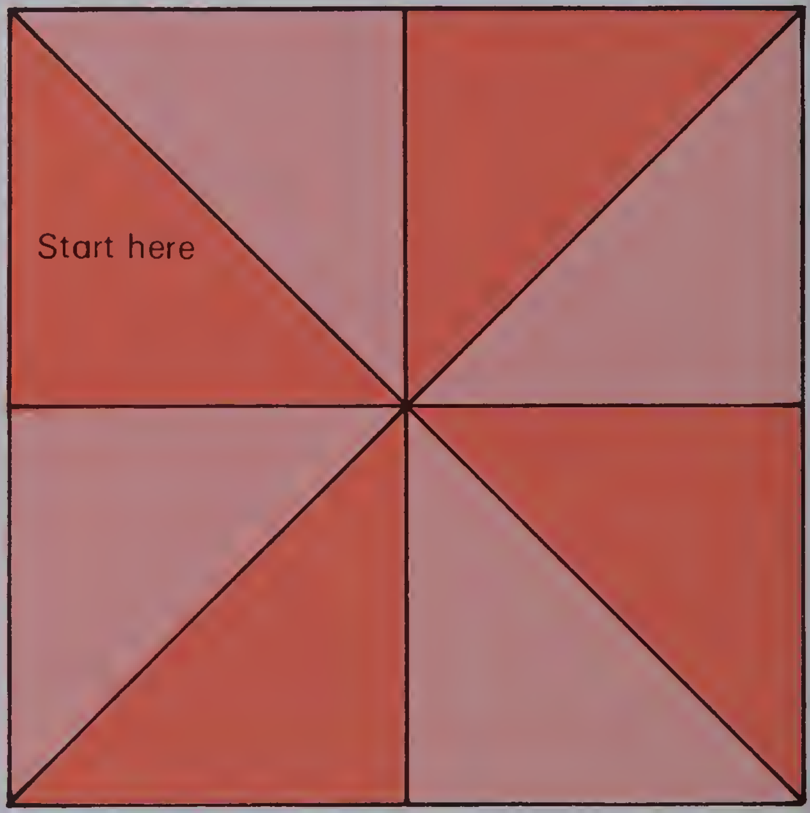
How can you move your tracing to form the pattern?

About what is the area?

Copy the pattern.

Extend it to build a new larger square.

About what is the area of the larger square?

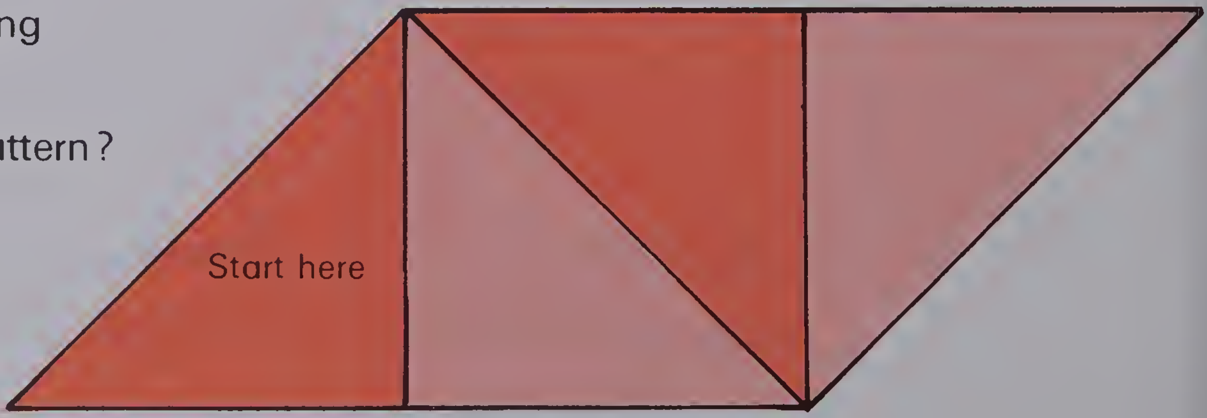


Tell how you move the tracing to form the pattern.

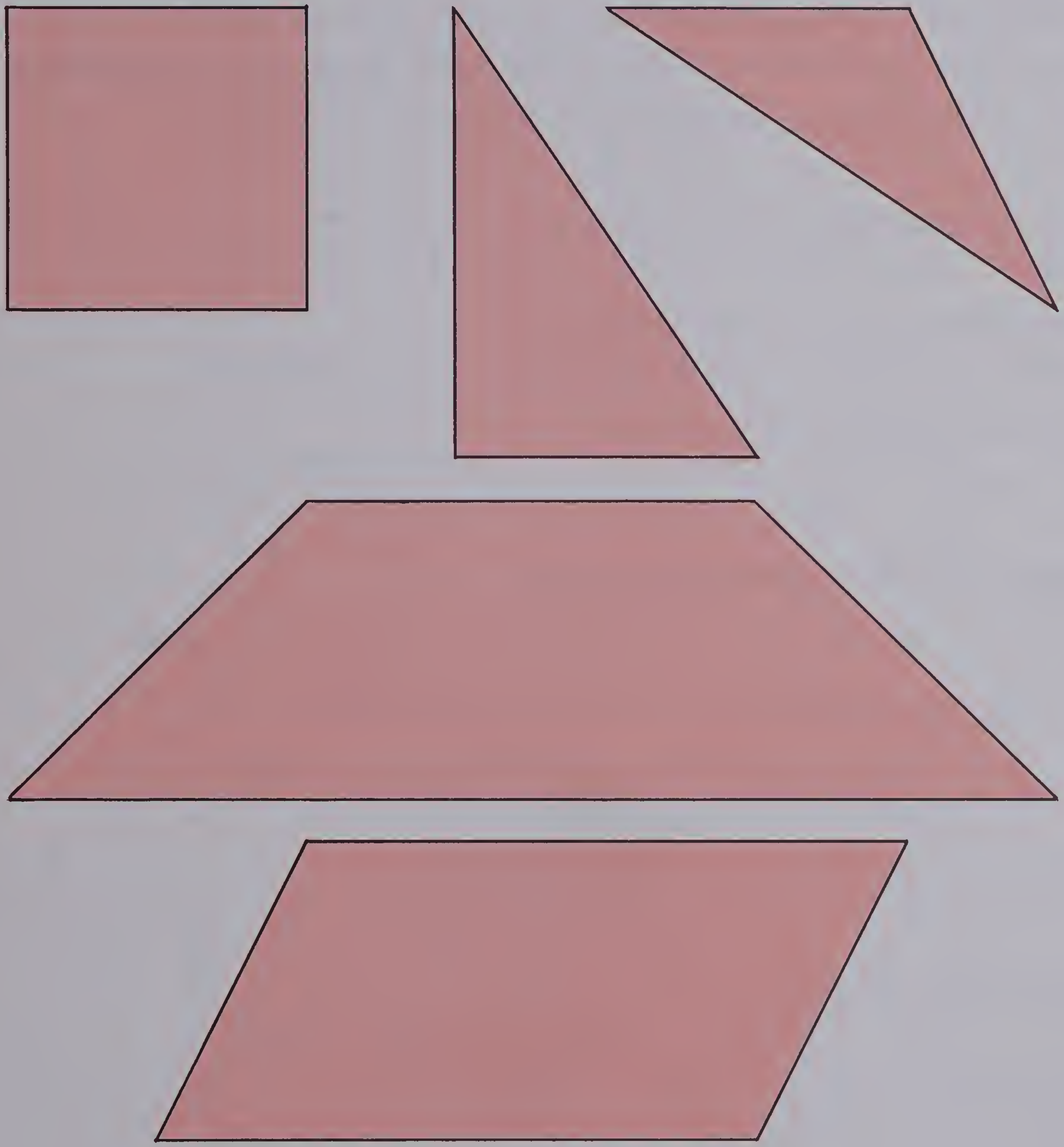
About what is the area of the pattern?

Copy and extend the pattern for 8 more entries.

About what is the area of the new pattern?



Make shapes like these by tracing and cutting from Bristol board.



Which shapes will fit on 2 cm by 2 cm graph paper
after a) flips b) slides c) turns?
You will need to use a large sheet of graph paper.

Further Practice / Unit 1 Place Value, Fractions and Decimals

1. Write the numeral.
   a) 5 tens and 6 b) 9 tens and 8 c) 10 + 10 + 7 d) 10 + 10 + 10 + 10 + 0
   e) 4 hundreds, 3 tens, and 8 f) 8 hundreds, 0 tens, and 6 g) 7 hundreds, 9 tens, and 9

2. Show as many numbers as you can. Use all 3 digits for each number.
   a) 2, 5, 8 b) 3, 8, 4 c) 0, 7, 0 d) 1, 1, 0 e) 9, 9, 1

3. Show the greatest number. Use the digits given.
   a) 3, 8, 0 b) 4, 0, 9 c) 1, 6, 1 d) 7, 8, 3 e) 0, 9, 0

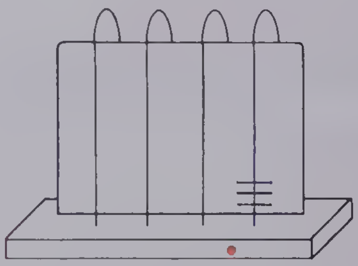
4. Show the least number. Use the digits given.
   a) 6, 5, 9 b) 0, 7, 4 c) 1, 0, 1 d) 1, 0, 0 e) 5, 1, 1

5. Draw a line segment 20 cm long. Show :
   a) $\frac{1}{10}$ b) $\frac{3}{10}$ c) $\frac{7}{10}$ d) $\frac{5}{10}$ e) $\frac{1}{2}$ f) $\frac{1}{4}$ g) $\frac{3}{4}$

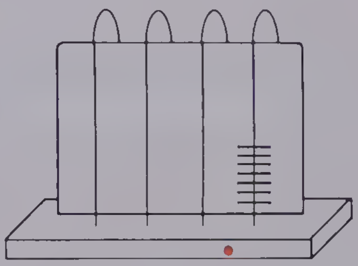
6. Complete by writing a decimal or a fraction.
   a) $\frac{3}{10} = ?$ b) $0.5 = ?$ c) $0.1 = ?$ d) $\frac{7}{10} = ?$ e) $0.9 = ?$

7. What decimal is shown?

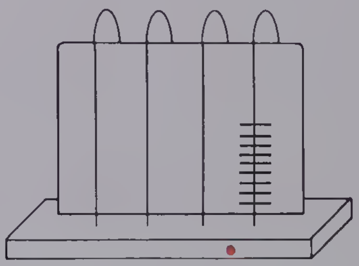
a)



b)



c)



8. Sketch an abacus to show
   a) 0.2 b) 0.4 c) 0.6 d) 0.5 e) 0.8 f) 0.1

9. Complete. Use = or > or <.
   a) $0.5 \ ? \ \frac{5}{10}$ b) $\frac{3}{10} \ ? \ 0.2$ c) $0.7 \ ? \ \frac{8}{10}$ d) $0.9 \ ? \ \frac{9}{10}$
   e) $\frac{6}{10} \ ? \ 0.7$ f) $\frac{4}{10} \ ? \ 0.3$ g) $0.5 \ ? \ \frac{6}{10}$ h) $0.8 \ ? \ \frac{9}{10}$

Addition and Subtraction Facts

10. Look at the number pair. Write the sum.

a) (7, 4) b) (3, 8) c) (9, 5) d) (6, 7) e) (8, 5) f) (6, 6)

11. Look at the number pair. Write the difference.

a) (11, 5) b) (12, 5) c) (14, 8) d) (17, 9) e) (16, 7) f) (13, 5)

12. Solve.

a) $n = 7 + 4$ b) $p = 8 + 5$ c) $q = 4 + 9$ d) $f = 5 + 6$ e) $k = 7 + 7$
f) $d = 9 + 8$ g) $v = 6 + 6$ h) $y = 3 + 9$ i) $m = 8 + 8$ j) $w = 9 + 7$

13. Solve.

a) $k = 16 - 8$ b) $n = 12 - 5$ c) $p = 13 - 8$ d) $q = 14 - 9$ e) $m = 16 - 7$
f) $v = 15 - 6$ g) $w = 15 - 8$ h) $y = 11 - 3$ i) $w = 10 - 4$ j) $r = 18 - 9$

14. Add. Think the sums as shown in part a).

a) $\begin{array}{r} 4 \curvearrowleft \\ 7 \curvearrowleft \\ \underline{3} \end{array}$ b) $\begin{array}{r} 5 \\ 6 \\ \underline{3} \end{array}$ c) $\begin{array}{r} 4 \\ 3 \\ \underline{9} \end{array}$ d) $\begin{array}{r} 5 \\ 5 \\ \underline{7} \end{array}$ e) $\begin{array}{r} 1 \\ 9 \\ \underline{8} \end{array}$ f) $\begin{array}{r} 5 \\ 7 \\ \underline{7} \end{array}$ g) $\begin{array}{r} 4 \\ 5 \\ \underline{6} \end{array}$ h) $\begin{array}{r} 3 \\ 9 \\ \underline{4} \end{array}$

15. Solve.

a) $k = 3 + 4 + 2$ b) $m = 5 + 6 + 4$ c) $n = 3 + 9 + 7$

16. Add.

a) $\begin{array}{r} 3 \\ \underline{4} \end{array}$ $\begin{array}{r} 13 \\ \underline{4} \end{array}$ $\begin{array}{r} 23 \\ \underline{4} \end{array}$ $\begin{array}{r} 73 \\ \underline{4} \end{array}$ b) $\begin{array}{r} 5 \\ \underline{6} \end{array}$ $\begin{array}{r} 15 \\ \underline{6} \end{array}$ $\begin{array}{r} 35 \\ \underline{6} \end{array}$ $\begin{array}{r} 85 \\ \underline{6} \end{array}$ c) $\begin{array}{r} 6 \\ \underline{4} \end{array}$ $\begin{array}{r} 16 \\ \underline{4} \end{array}$ $\begin{array}{r} 56 \\ \underline{4} \end{array}$ $\begin{array}{r} 96 \\ \underline{4} \end{array}$

d) $\begin{array}{r} 8 \\ \underline{7} \end{array}$ $\begin{array}{r} 18 \\ \underline{7} \end{array}$ $\begin{array}{r} 28 \\ \underline{7} \end{array}$ $\begin{array}{r} 68 \\ \underline{7} \end{array}$ e) $\begin{array}{r} 8 \\ \underline{9} \end{array}$ $\begin{array}{r} 38 \\ \underline{9} \end{array}$ $\begin{array}{r} 78 \\ \underline{9} \end{array}$ $\begin{array}{r} 88 \\ \underline{9} \end{array}$ f) $\begin{array}{r} 7 \\ \underline{7} \end{array}$ $\begin{array}{r} 17 \\ \underline{7} \end{array}$ $\begin{array}{r} 67 \\ \underline{7} \end{array}$ $\begin{array}{r} 77 \\ \underline{7} \end{array}$

17. Subtract.

a) $\begin{array}{r} 13 \\ \underline{4} \end{array}$ $\begin{array}{r} 23 \\ \underline{4} \end{array}$ $\begin{array}{r} 43 \\ \underline{4} \end{array}$ $\begin{array}{r} 63 \\ \underline{4} \end{array}$ b) $\begin{array}{r} 15 \\ \underline{6} \end{array}$ $\begin{array}{r} 25 \\ \underline{6} \end{array}$ $\begin{array}{r} 45 \\ \underline{6} \end{array}$ $\begin{array}{r} 85 \\ \underline{6} \end{array}$ c) $\begin{array}{r} 16 \\ \underline{8} \end{array}$ $\begin{array}{r} 36 \\ \underline{8} \end{array}$ $\begin{array}{r} 56 \\ \underline{8} \end{array}$ $\begin{array}{r} 76 \\ \underline{8} \end{array}$

d) $\begin{array}{r} 17 \\ \underline{9} \end{array}$ $\begin{array}{r} 27 \\ \underline{9} \end{array}$ $\begin{array}{r} 37 \\ \underline{9} \end{array}$ $\begin{array}{r} 77 \\ \underline{9} \end{array}$ e) $\begin{array}{r} 14 \\ \underline{7} \end{array}$ $\begin{array}{r} 24 \\ \underline{7} \end{array}$ $\begin{array}{r} 44 \\ \underline{7} \end{array}$ $\begin{array}{r} 64 \\ \underline{7} \end{array}$ f) $\begin{array}{r} 11 \\ \underline{5} \end{array}$ $\begin{array}{r} 21 \\ \underline{5} \end{array}$ $\begin{array}{r} 31 \\ \underline{5} \end{array}$ $\begin{array}{r} 41 \\ \underline{5} \end{array}$

Addition and Subtraction / Regrouping

18. Add.

a) 35	b) 42	c) 36	d) 25	e) 51	f) 47	g) 29
15	19	18	17	36	24	13

h) 68	i) 74	j) 53	k) 72	l) 41	m) 37	n) 63
25	18	29	18	19	48	28

19. Subtract.

a) 31	b) 42	c) 65	d) 54	e) 73	f) 98	g) 86
25	16	28	36	47	69	49

h) 67	i) 85	j) 92	k) 37	l) 44	m) 36	n) 53
38	69	27	19	26	17	29

20. Add.

a) 149	b) 227	c) 656	d) 784	e) 838	f) 354
243	348	215	108	125	239

g) 563	h) 382	i) 755	j) 443	k) 172	l) 494
372	151	194	382	385	260

m) 375	n) 187	o) 293	p) 469	q) 757	r) 299
286	537	468	185	158	687

21. Subtract.

a) 647	b) 325	c) 441	d) 754	e) 863	f) 462
528	106	318	237	529	215

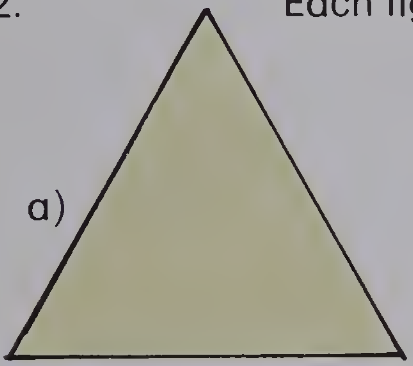
g) 738	h) 869	i) 645	j) 527	k) 852	l) 973
482	398	273	164	591	682

m) 364	n) 828	o) 491	p) 672	q) 845	r) 956
198	239	193	488	587	278

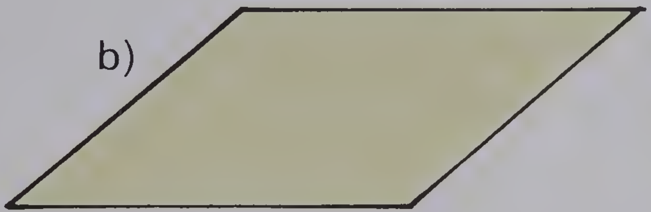
Perimeter and Area

22. Each figure has a perimeter equal to the length of a line segment. Find the perimeters to the nearest centimetre. Match the line segments with the figures.

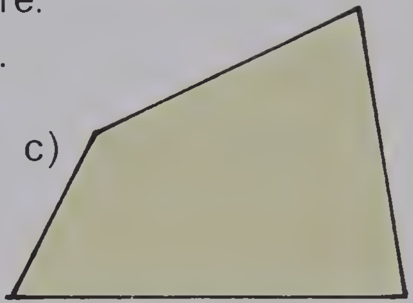
a)



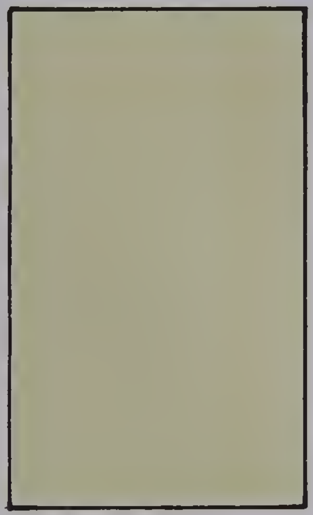
b)



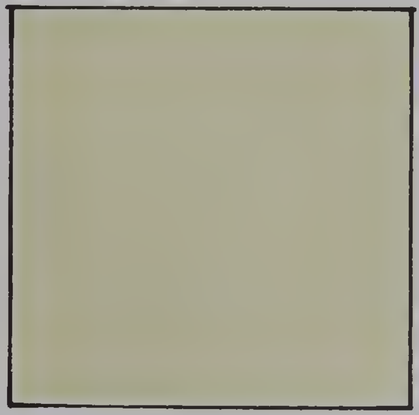
c)



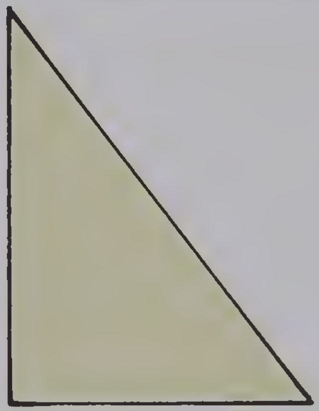
d)

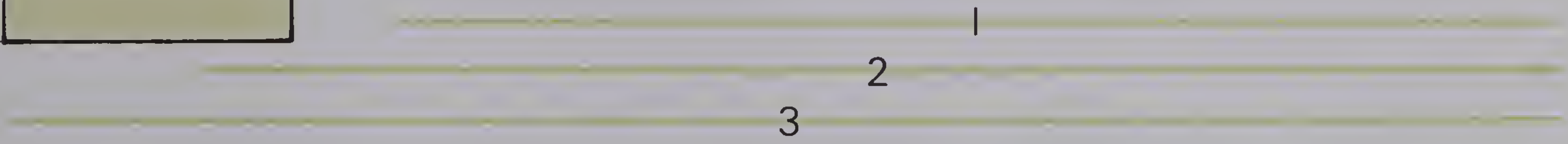


e)



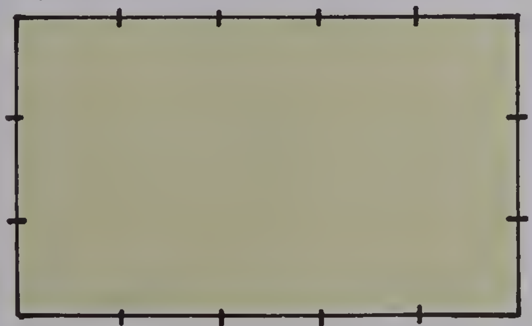
f)



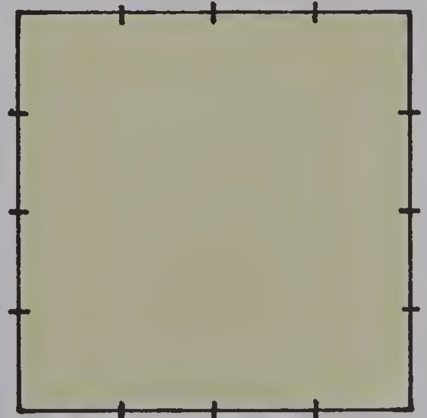


23. Find the area in square centimetres.

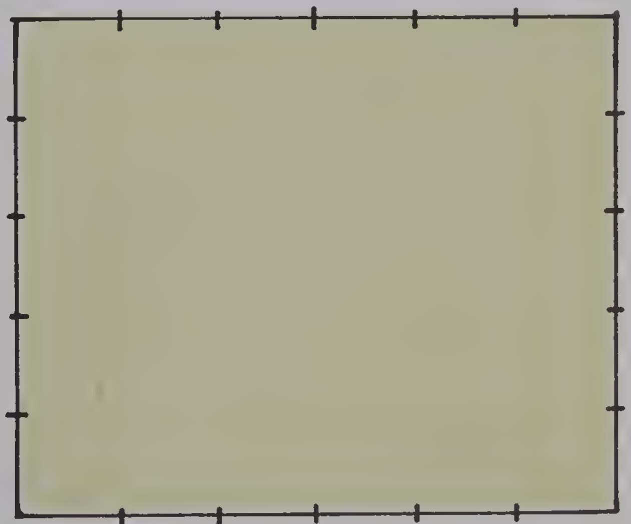
a)



b)



c)



24. Find the area of a square if each side is:

a) 7 cm b) 5 cm c) 9 cm d) 8 cm e) 6 cm f) 10 cm

Use 1 cm graph paper to help you find the answers.

Multiplication and Division

25. Multiply.
    a) (5, 3) b) (6, 2) c) (4, 7) d) (5, 6) e) (7, 3)

26. Solve.
    a) $k = 6 \times 7$ b) $p = 3 \times 6$ c) $n = 4 \times 7$ d) $y = 5 \times 6$
    e) $w = 4 \times 5$ f) $m = 3 \times 7$

27. Divide.
    a) (15, 3) b) (24, 6) c) (36, 6) d) (28, 4) e) (21, 7) f) (30, 5)
    g) (42, 7) h) (35, 7)

28. Solve.
    a) $a = 24 \div 4$ b) $p = 21 \div 3$ c) $v = 28 \div 7$ d) $w = 30 \div 6$

29. Multiply.
    a) (4, 8) b) (5, 9) c) (8, 7) d) (6, 9) e) (9, 8) f) (9, 9)

30. Solve.
    a) $n = 6 \times 9$ b) $p = 4 \times 8$ c) $m = 9 \times 5$ d) $v = 3 \times 9$ e) $w = 6 \times 8$

31. Divide.
    a) (40, 5) b) (36, 6) c) (42, 7) d) (48, 6) e) (63, 9)

32. Solve.
    a) $k = 48 \div 8$ b) $m = 42 \div 6$ c) $n = 63 \div 7$ d) $q = 100 \div 10$

33. Multiply.
    a) (3, 10) b) (6, 10) c) (7, 10) d) (12, 10) e) (23, 10)

34. Solve.
    a) $w = 9 \times 10$ b) $p = 17 \times 10$ c) $r = 21 \times 10$ d) $q = 39 \times 10$

35. Divide.
    a) (30, 10) b) (60, 10) c) (120, 10) d) (190, 10) e) (460, 10)

36. Solve.
    a) $n = 50 \div 10$ b) $p = 100 \div 10$ c) $r = 200 \div 10$ d) $m = 350 \div 10$
    e) $k = 900 \div 10$ f) $q = 1000 \div 10$

Answers to Further Practice / Unit I

1. a) 56 b) 98 c) 27 d) 40 e) 438 f) 806 g) 799

2. a) 258, 285, 528, 582, 825, 852 b) 348, 384, 438, 483, 834, 843

c) 007, 070, 700 d) 011, 101, 110 e) 199, 919, 991

3. a) 830 b) 940 c) 611 d) 873 e) 900

4. a) 569 b) 047 c) 011 d) 001 e) 115

5. a) 2 cm b) 6 cm c) 14 cm d) 10 cm e) 10 cm f) 5 cm g) 15 cm

6. a) 0.3 b) $\frac{5}{10}$ c) $\frac{1}{10}$ d) 0.7 e) $\frac{9}{10}$

7. a) 0.3 b) 0.7 c) 0.9

9. a) $=$ b) $>$ c) $<$ d) $=$ e) $<$ f) $>$ g) $<$ h) $<$

10. a) 11 b) 11 c) 14 d) 13 e) 13 f) 12

11. a) 6 b) 7 c) 6 d) 8 e) 9 f) 8

12. a) $n = 11$ b) $p = 13$ c) $q = 13$ d) $f = 11$ e) $k = 14$ f) $d = 17$

g) $v = 12$ h) $y = 12$ i) $m = 16$ j) $w = 16$

13. a) $k = 8$ b) $n = 7$ c) $p = 5$ d) $q = 5$ e) $m = 9$ f) $v = 9$ g) $w = 7$

h) $y = 8$ i) $w = 6$ j) $r = 9$

14. a) 14 b) 14 c) 16 d) 17 e) 18 f) 19 g) 15 h) 16

15. a) $k = 9$ b) $m = 15$ c) $n = 19$

16. a) 7, 17, 27, 77 b) 11, 21, 41, 91 c) 10, 20, 60, 100

d) 15, 25, 35, 75 e) 17, 47, 87, 97 f) 14, 24, 74, 84

17. a) 9, 19, 39, 59 b) 9, 19, 39, 79 c) 8, 28, 48, 68

d) 8, 18, 28, 68 e) 7, 17, 37, 57 f) 6, 16, 26, 36

18. a) 50 b) 61 c) 54 d) 42 e) 87 f) 71 g) 42

h) 93 i) 92 j) 82 k) 90 l) 60 m) 85 n) 91

19. a) 6 b) 26 c) 37 d) 18 e) 26 f) 29 g) 37

h) 29 i) 16 j) 65 k) 18 l) 18 m) 19 n) 24

20. a) 392 b) 575 c) 871 d) 892 e) 963 f) 593

g) 935 h) 533 i) 949 j) 825 k) 557 l) 754

m) 661 n) 724 o) 761 p) 654 q) 915 r) 986

21. a) 119 b) 219 c) 123 d) 517 e) 334 f) 247
g) 256 h) 471 i) 372 j) 363 k) 261 l) 291
m) 166 n) 589 o) 298 p) 184 q) 258 r) 678

22. a) matches 1 b) matches 2 c) matches 1 d) matches 3 e) matches 3 f) matches 1
12 cm 14 cm 12 cm 16 cm 16 cm 12 cm

23. a) 15 cm^2 b) 16 cm^2 c) 30 cm^2

24. a) 49 cm^2 b) 25 cm^2 c) 81 cm^2 d) 64 cm^2 e) 36 cm^2 f) 100 cm^2

25. a) 15 b) 12 c) 28 d) 30 e) 21

26. a) $k = 42$ b) $p = 18$ c) $n = 28$ d) $y = 30$ e) $w = 20$ f) $m = 21$

27. a) 5 b) 4 c) 6 d) 7 e) 3 f) 6 g) 6 h) 5

28. a) $a = 6$ b) $p = 7$ c) $v = 4$ d) $w = 5$

29. a) 32 b) 45 c) 56 d) 54 e) 72 f) 81

30. a) $n = 54$ b) $p = 32$ c) $m = 45$ d) $v = 27$ e) $w = 48$

31. a) 8 b) 6 c) 6 d) 8 e) 7

32. a) $k = 6$ b) $m = 7$ c) $n = 9$ d) $q = 10$

33. a) 30 b) 60 c) 70 d) 120 e) 230

34. a) $w = 90$ b) $p = 170$ c) $r = 210$ d) $q = 390$

35. a) 3 b) 6 c) 12 d) 19 e) 46

36. a) $n = 5$ b) $p = 10$ c) $r = 20$ d) $m = 35$ e) $k = 90$ f) $q = 100$

Further Practice / Unit 2 Addition and Subtraction / 1 Decimal

1. Add.

a) (0.6, 0.4) b) (0.5, 0.7) c) (0.6, 0.9) d) (0.8, 0.7) e) (0.3, 0.9)
f) (0.7, 0.8) g) (0.2, 0.8) h) (0.4, 0.7) i) (0.5, 0.9) j) (0.9, 0.8)

2. Subtract.

a) (1.4, 0.7) b) (1.5, 0.8) c) (1.3, 0.4) d) (1.2, 0.6) e) (1.6, 0.7)
f) (1.1, 0.6) g) (1.7, 0.9) h) (1.1, 0.7) i) (1.8, 0.9) j) (1.0, 0.3)

3. Add.

a) 1.4	b) 1.5	c) 1.8	d) 1.9	e) 1.6	f) 1.8
0.3	0.6	0.7	0.7	0.4	0.3
g) 1.5	h) 1.3	i) 1.6	j) 1.9	k) 1.2	l) 1.7
1.7	1.8	1.7	1.4	1.9	1.8

4. Subtract.

a) 1.6	b) 1.5	c) 1.2	d) 1.3	e) 1.4	f) 1.7
0.7	0.8	0.4	0.5	0.7	0.9
g) 2.3	h) 2.5	i) 2.6	j) 2.7	k) 2.1	l) 2.7
1.4	1.7	1.8	0.9	0.6	1.8

5. Add.

a) 4.6	b) 3.7	c) 2.7	d) 8.3	e) 2.5	f) 3.9
2.9	1.5	1.9	2.9	6.7	4.8
g) 7.1	h) 7.3	i) 6.2	j) 3.4	k) 7.8	l) 9.2
3.9	6.8	8.7	7.9	5.8	4.9

6. Subtract.

a) 8.1	b) 6.8	c) 3.4	d) 5.4	e) 6.3	f) 7.5
3.4	2.9	1.8	3.5	2.7	3.9
g) 4.0	h) 5.1	i) 6.7	j) 2.5	k) 8.1	l) 7.7
3.8	2.9	1.8	1.6	3.7	1.9

Addition and Subtraction / 2 Decimals

7. Add.

a)	b)	c)	d)	e)	f)
5.23	6.25	3.46	5.38	7.49	8.17
2.47	3.06	2.17	2.57	3.23	0.26

g)	h)	i)	j)	k)	l)
1.52	2.35	9.82	4.63	9.74	6.80
6.74	4.81	0.53	2.85	0.91	2.41

m)	n)	o)	p)	q)	r)
4.75	6.58	7.43	5.39	8.45	3.97
3.48	2.93	1.89	1.72	0.76	2.84

8. Subtract.

a)	b)	c)	d)	e)	f)
3.54	4.72	3.65	5.43	7.26	8.61
1.26	1.48	0.18	3.28	2.07	4.25

g)	h)	i)	j)	k)	l)
8.37	7.49	6.58	5.62	8.83	9.76
4.52	3.76	2.87	3.71	7.91	3.94

9. Find the total amount.

a)	b)	c)	d)	e)	f)
$5.67	$8.79	$9.19	$7.61	$9.99	$6.11
3.29	4.33	6.58	8.45	3.49	8.99

10. Find the difference between the amounts.

a)	b)	c)	d)	e)	f)
$7.40	$2.99	$3.67	$4.50	$9.42	$7.15
3.59	1.75	1.89	2.77	6.85	6.95

11. Find the total amount.

a)	b)	c)	d)	e)	f)
$7.35	$6.25	$2.85	$5.50	$4.62	$6.79
0.14	1.48	0.34	0.25	1.19	1.25
0.78	0.37	0.19	1.39	0.47	1.50

g)	h)	i)	j)	k)	l)
$5.82	$7.68	$35.64	$74.83	$63.29	$85.37
6.59	3.45	7.58	2.99	5.38	6.92
7.43	5.96	2.95	6.54	4.73	8.74

Multiplication and Division

12. Multiply.

a) (7, 4) b) (6, 8) c) (3, 9) d) (5, 8) e) (7, 7)
f) (9, 4) g) (8, 5) h) (6, 10) i) (10, 7) j) (4, 10)
k) (8, 10) l) (5, 10) m) (9, 10) n) (10, 3)

13. Multiply.

a) (5, 40) b) (6, 20) c) (7, 50) d) (6, 80) e) (9, 40) f) (8, 90)

14. Find the products this way.

a)
$$\begin{aligned} 6 \times 14 &= 6 \times (10 + 4) \\ &= (6 \times 10) + (6 \times 4) \\ &= \quad 60 \quad + \quad 24 \\ &= \quad ? \end{aligned}$$

b)
$$\begin{aligned} 7 \times 19 &= 7 \times (10 + 9) \\ &= (7 \times ?) + (7 \times ?) \\ &= \quad ? \quad + \quad ? \\ &= \quad ? \end{aligned}$$

c)
$$\begin{aligned} 60 \times 18 &= 60 \times (10 + 8) \\ &= (60 \times 10) + (60 \times 8) \\ &= \quad ? \quad + \quad ? \\ &= \quad ? \end{aligned}$$

d)
$$\begin{aligned} 70 \times 19 &= 70 \times (10 + 9) \\ &= (70 \times 10) + (70 \times 9) \\ &= \quad ? \quad + \quad ? \\ &= \quad ? \end{aligned}$$

e) 5×18 f) 4×17 g) 70×16 h) 80×12 i) 90×13

15. Multiply. Estimate the product before calculating.

a) $\begin{array}{r} 37 \\ 5 \\ \hline \end{array}$ b) $\begin{array}{r} 41 \\ 4 \\ \hline \end{array}$ c) $\begin{array}{r} 64 \\ 7 \\ \hline \end{array}$ d) $\begin{array}{r} 73 \\ 6 \\ \hline \end{array}$ e) $\begin{array}{r} 84 \\ 3 \\ \hline \end{array}$ f) $\begin{array}{r} 96 \\ 7 \\ \hline \end{array}$ g) $\begin{array}{r} 87 \\ 8 \\ \hline \end{array}$

h) $\begin{array}{r} 59 \\ 5 \\ \hline \end{array}$ i) $\begin{array}{r} 67 \\ 4 \\ \hline \end{array}$ j) $\begin{array}{r} 76 \\ 3 \\ \hline \end{array}$ k) $\begin{array}{r} 82 \\ 7 \\ \hline \end{array}$ l) $\begin{array}{r} 85 \\ 9 \\ \hline \end{array}$ m) $\begin{array}{r} 93 \\ 8 \\ \hline \end{array}$ n) $\begin{array}{r} 89 \\ 6 \\ \hline \end{array}$

16. Divide.

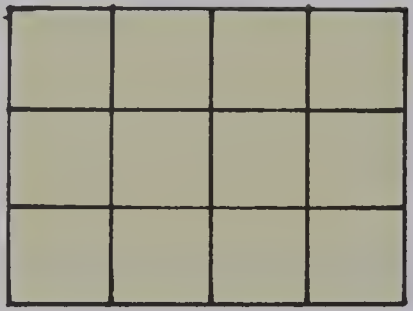
a) $5\overline{)64}$ b) $3\overline{)88}$ c) $4\overline{)93}$ d) $6\overline{)79}$ e) $8\overline{)99}$

f) $7\overline{)112}$ g) $8\overline{)123}$ h) $9\overline{)137}$ i) $8\overline{)156}$ j) $9\overline{)143}$

Area

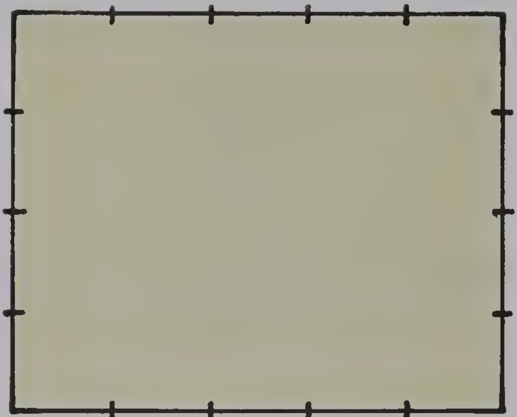
17. Complete.

a)



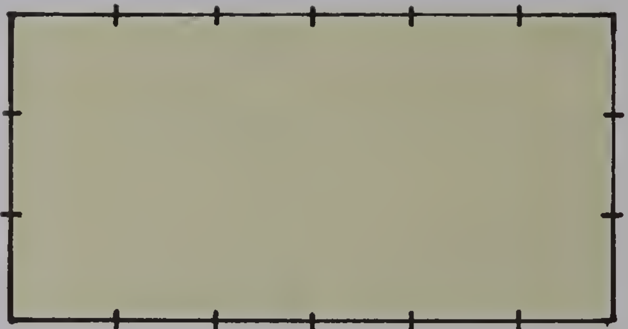
Area = (4 × 3) cm²
= ? cm²

b)



Area = (? × ?) cm²
= ? cm²

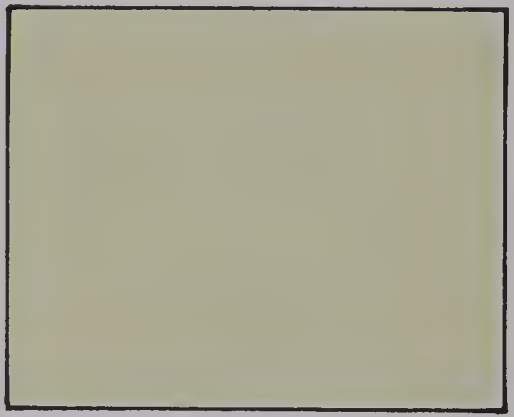
c)



Area = (? × ?) cm²
= ? cm²

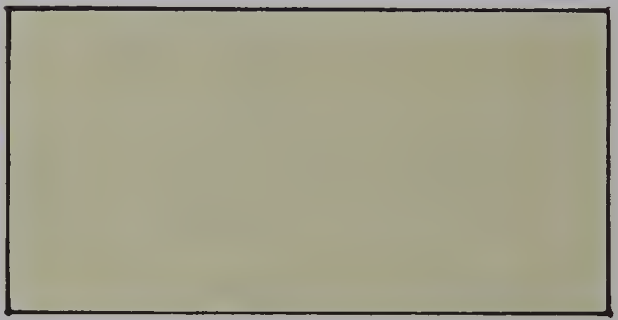
18.

a)



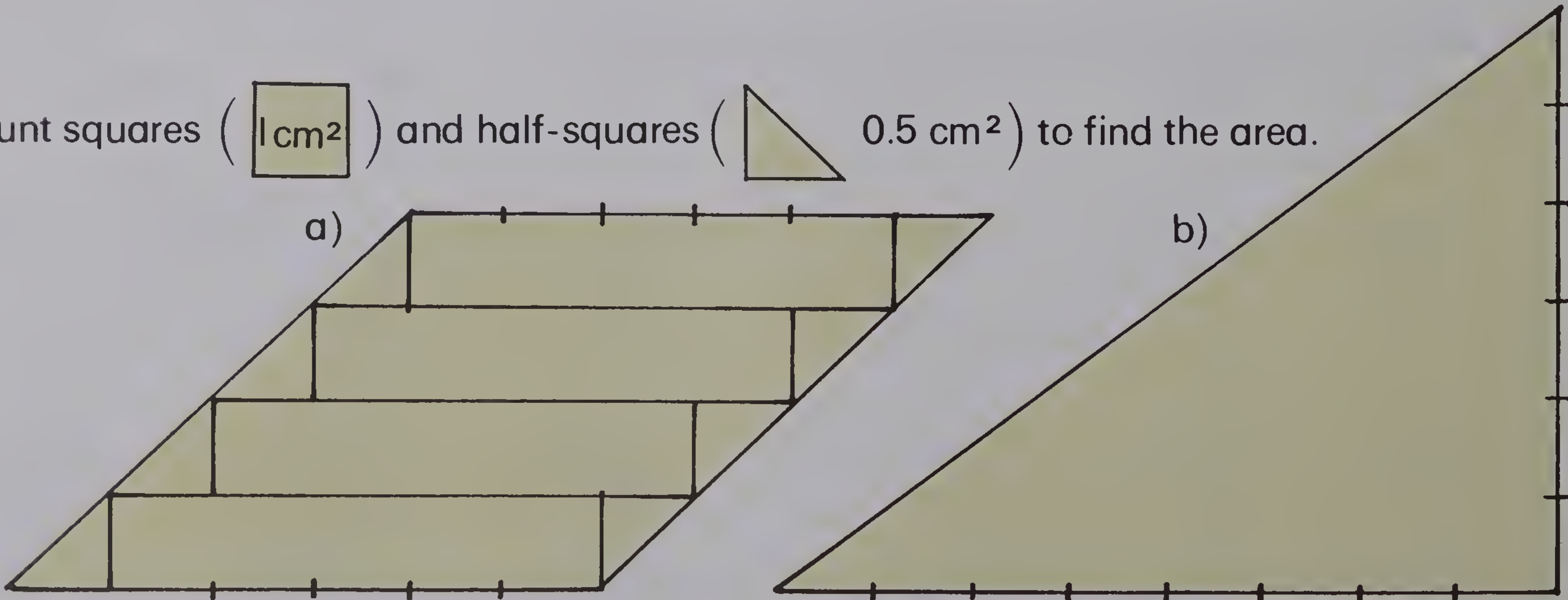
Length = ? cm
Width = ? cm
Area = ? cm²

b)



Length = ? cm
Width = ? cm
Area = ? cm²

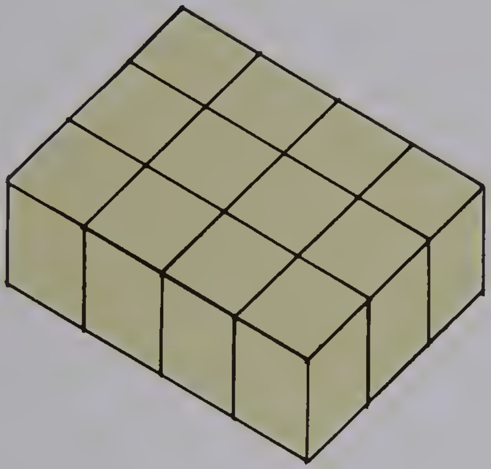
19. Count squares (1 cm²) and half-squares (◺ 0.5 cm²) to find the area.



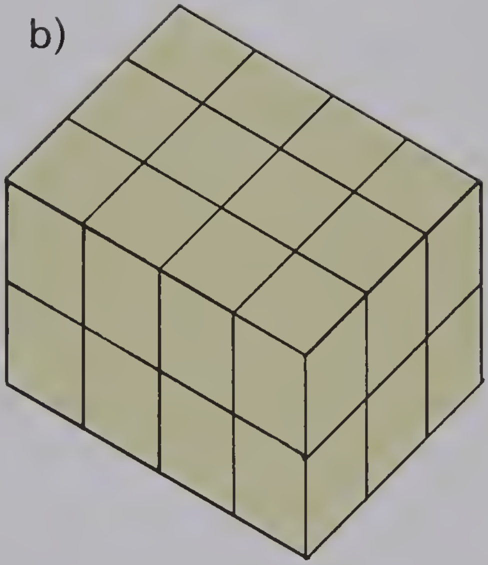
Volume

20. Complete. Each cube is 1 cm^3

a)



b)



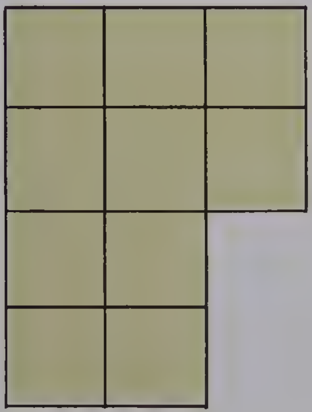
What is the length?
What is the width?
How many layers of cubes are there?
How many cubes are there?
What is the volume?

c) What is the volume if there are 3 layers, 4 layers, 5 layers, 6 layers, 7 layers, 8 layers?

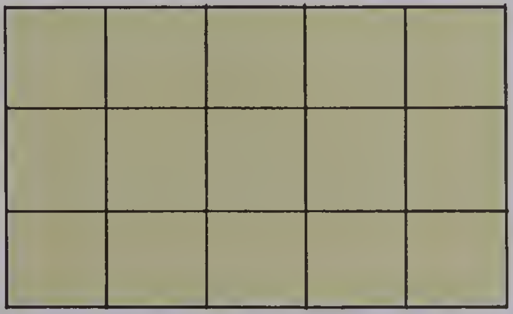
21. What is the volume?
   a) Each layer has 15 cm^3. There are 2 layers.
   b) Each layer has 18 cm^3. There are 4 layers.
   c) Each layer has 14 cm^3. There are 5 layers.

22. What is the volume, if 4 layers of cubes are built on each pattern?

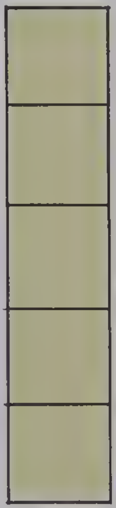
a)



b)



c)



Answers to Further Practice / Unit 2

1. a) 1 b) 1.2 c) 1.5 d) 1.5 e) 1.2 f) 1.5 g) 1 h) 1.1 i) 1.4 j) 1.7
2. a) 0.7 b) 0.7 c) 0.9 d) 0.6 e) 0.9 f) 0.5 g) 0.8 h) 0.4 i) 0.9 j) 0.7
3. a) 1.7 b) 2.1 c) 2.5 d) 2.6 e) 2.0 f) 2.1 g) 3.2 h) 3.1 i) 3.3 j) 3.3
   k) 3.1 l) 3.5
4. a) 0.9 b) 0.7 c) 0.8 d) 0.8 e) 0.7 f) 0.8 g) 0.9 h) 0.8 i) 0.8 j) 1.8
   k) 1.5 l) 0.9
5. a) 7.5 b) 5.2 c) 4.6 d) 11.2 e) 9.2 f) 8.7 g) 11 h) 14.1 i) 14.9 j) 11.3
   k) 13.6 l) 14.1
6. a) 4.7 b) 3.9 c) 1.6 d) 1.9 e) 3.6 f) 3.6 g) 0.2 h) 2.2 i) 4.9 j) 0.9
   k) 4.4 l) 5.8
7. a) 7.70 b) 9.31 c) 5.63 d) 7.95 e) 10.72 f) 8.43 g) 8.26 h) 7.16
   i) 10.35 j) 7.48 k) 10.65 l) 9.21 m) 8.23 n) 9.51 o) 9.32 p) 7.11
   q) 9.21 r) 6.81
8. a) 2.28 b) 3.24 c) 3.47 d) 2.15 e) 5.19 f) 4.36 g) 3.85 h) 3.73 i) 3.71
   j) 1.91 k) 0.92 l) 5.82
9. a) $8.96 b) $13.12 c) $15.77 d) $16.06 e) $13.48 f) $15.10
10. a) $3.81 b) $1.24 c) $1.78 d) $1.73 e) $2.57 f) $0.20
11. a) $8.27 b) $8.10 c) $3.38 d) $7.14 e) $6.28 f) $9.54 g) $19.84
    h) $17.09 i) $46.17 j) $84.36 k) $73.40 l) $101.03
12. a) 28 b) 48 c) 27 d) 40 e) 49 f) 36 g) 40 h) 60 i) 70 j) 40
    k) 80 l) 50 m) 90 n) 30
13. a) 200 b) 120 c) 350 d) 480 e) 360 f) 720
14. a) 84 b) 133 c) 1080 d) 1330 e) 90 f) 68 g) 1120 h) 960 i) 1170
15. a) 185 b) 164 c) 448 d) 438 e) 252 f) 672 g) 696 h) 295 i) 268
    j) 228 k) 574 l) 765 m) 744 n) 534
16. a) 12R4 b) 29R1 c) 23R1 d) 13R1 e) 12R3 f) 16 g) 15R3 h) 15R2
    i) 19R4 j) 15R8
17. a) 12 cm² b) 20 cm² c) 18 cm²
18. a) 5 cm, 4 cm, 20 cm² b) 6 cm, 3 cm, 18 cm²

19. a) 24 cm^2 b) 24 cm^2

20. a) 4 cm, 3 cm, 1, 12, 12 cm^3 b) 4 cm, 3 cm, 2, 24, 24 cm^3

c) 36 cm^3, 48 cm^3, 60 cm^3, 72 cm^3, 84 cm^3, 96 cm^3

21. a) 30 cm^3 b) 72 cm^3 c) 70 cm^3

22. a) 40 cm^3 b) 60 cm^3 c) 20 cm^3

Further Practice / Unit 3 Addition and Subtraction/ Decimals and Fractions

1. Add.

a) 3875 4369	b) 5148 6327	c) 2756 9385	d) 8834 6957	e) 8754 9368	f) 9375 7648
g) 475.3 546.2	h) 837.4 591.6	i) 931.8 347.5	j) 637.5 385.9	k) 749.9 353.6	l) 618.9 354.8
m) 659.43 248.35	n) 649.67 873.15	o) 658.39 934.78	p) 872.46 915.99	q) 528.68 567.48	r) 749.38 615.96

2. Subtract.

a) 7459 2136	b) 4935 1167	c) 6374 4189	d) 8546 3659	e) 5308 2219	f) 8130 5249
g) 636.5 142.8	h) 953.7 614.8	i) 736.8 517.9	j) 840.3 412.8	k) 605.4 123.8	l) 924.0 886.5
m) 659.45 367.28	n) 714.63 429.57	o) 603.45 351.87	p) 530.62 413.97	q) 827.06 641.39	r) 944.50 356.87

3. Show, by using number line diagrams, that:

a) $\frac{1}{2} = \frac{2}{4}$ b) $\frac{1}{5} = \frac{2}{10}$ c) $\frac{3}{5} = \frac{6}{10}$ d) $\frac{6}{4} = \frac{3}{2}$ e) $\frac{5}{2} = \frac{10}{4}$

4. Write a sentence using $<$ or $=$ or $>$.

a) $\frac{1}{2}, \frac{3}{4}$ b) $\frac{3}{5}, \frac{6}{10}$ c) $\frac{7}{10}, \frac{3}{5}$ d) $\frac{5}{2}, \frac{12}{4}$ e) $\frac{10}{5}, \frac{20}{10}$

5. Solve.

a) $k = \frac{2}{4} + \frac{1}{4}$ b) $p = \frac{4}{10} + \frac{5}{10}$ c) $m = \frac{3}{5} + \frac{2}{5}$ d) $n = \frac{1}{2} + \frac{1}{2}$ e) $y = \frac{4}{10} + \frac{3}{10}$

6. Subtract.

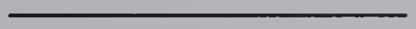
a) $\frac{3}{5} - \frac{1}{5}$ b) $\frac{3}{4} - \frac{2}{4}$ c) $\frac{2}{2} - \frac{1}{2}$ d) $\frac{4}{10} - \frac{3}{10}$ e) $\frac{10}{10} - \frac{7}{10}$ f) $\frac{5}{5} - \frac{3}{5}$ g) $\frac{10}{10} - \frac{8}{10}$

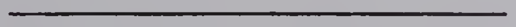
7. Solve.

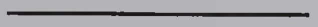
a) $k = \frac{3}{4} - \frac{1}{4}$ b) $p = \frac{2}{2} - \frac{1}{2}$ c) $m = \frac{8}{10} - \frac{5}{10}$ d) $n = \frac{5}{5} - \frac{2}{5}$ e) $q = \frac{10}{10} - \frac{9}{10}$

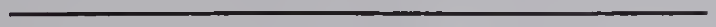
Length

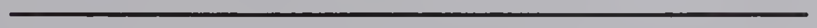
8. Find the length of each line segment
   a) in centimetres and
   b) in millimetres.

a)


b)


c)


d)


e)


9. Turn your ruler over to the blank side.
   Draw a line segment that you think is 9 cm long.
   Record the length in millimetres.
   Now use the other side of the ruler to make it 9 cm long.
   Repeat for
   a) 6 cm b) 12 cm c) 14 cm d) 18 cm e) 10 cm f) 20 cm

10. Give each length in millimetres.
    a) 11 cm b) 14 cm c) 19 cm d) 25 cm e) 30 cm f) 35 cm

11. Give each length in centimetres.
    a) 30 mm b) 50 mm c) 80 mm d) 100 mm e) 400 mm f) 550 mm

12. Give each length in centimetres.
    a) 2 m b) 4 m c) 7 m d) 9 m e) 25 m f) 100 m

13. Give each length in metres.
    a) 300 cm b) 600 cm c) 800 cm d) 1000 cm e) 1200 cm f) 1500 cm

Multiplying and Dividing by 10 and 100

14. Complete the patterns.

a) $8 \times 1 = ?$
$8 \times 10 = ?$
$8 \times 100 = ?$

b) $7 \times 1 = ?$
$7 \times 10 = ?$
$7 \times 100 = ?$

c) $11 \times 1 = ?$
$11 \times 10 = ?$
$11 \times 100 = ?$

d) $18 \times 1 = ?$
$18 \times 10 = ?$
$18 \times 100 = ?$

15. Find the products.

a) 9×100 b) 17×10 c) 38×10 d) 12×100 e) 42×100
f) 67×100 g) 93×100

16. How many cents?

a) \$6 b) \$9 c) \$14 d) \$27 e) 9 dimes f) 14 dimes g) \$24
h) 20 dimes i) \$20 j) \$38 k) \$70 l) 100 dimes m) \$90 n) \$100

17. How many centimetres?

a) 3 m b) 9 m c) 11 m d) 19 m e) 30 m f) 47 m g) 91 m

18. Complete the patterns.

a) $7 \div 1 = ?$
$70 \div 10 = ?$
$700 \div 100 = ?$

b) $15 \div 1 = ?$
$150 \div 10 = ?$
$1500 \div 100 = ?$

c) $27 \div 1 = ?$
$270 \div 10 = ?$
$2700 \div 100 = ?$

d) $83 \div 1 = ?$
$830 \div 10 = ?$
$8300 \div 100 = ?$

e) $50 \div 1 = ?$
$500 \div 10 = ?$
$5000 \div 100 = ?$

19. Solve.

a) $p = 40 \div 10$ b) $q = 300 \div 100$ c) $n = 7400 \div 100$
d) $m = 9000 \div 100$ e) $y = 1000 \div 100$

20. How many dollars?

a) 600¢ b) 70 dimes c) 90 dimes d) 800¢ e) 2500¢
f) 8000¢ g) 9500¢

21. How many metres?

a) 300 cm b) 600 cm c) 2000 cm d) 3100 cm e) 900 cm f) 9000 cm

Multiplication and Division

22. Complete.

a) 57 × 9 is about 60 × 10 or ?
b) 121 × 11 is about 120 × ? or ?
c) 81 × 12 is about ? × ? or ?
d) 119 × 8 is about 120 × ? or ?

23. Estimate.

a) 19 × 9 b) 47 × 8 c) 317 × 9 d) 421 × 8 e) 531 × 11 f) 691 × 12

24. Estimate. Calculate.

a) 41 × 8 b) 121 × 9 c) 163 × 8 d) 218 × 3 e) 419 × 4 f) 521 × 5
g) 651 × 6 h) 762 × 8 i) 818 × 7 j) 911 × 9 k) 892 × 6 l) 999 × 9

25. Solve.

a) $k = 30 \times 50$ b) $n = 40 \times 80$ c) $p = 17 \times 10$ d) $q = 29 \times 10$

26. Complete.

a) 147 ÷ 9 is about 150 ÷ 10 or ?
b) 281 ÷ 12 is about 280 ÷ ? or ?
c) 131 ÷ 11 is about 130 ÷ ? or ?
d) 291 ÷ 9 is about ? ÷ ? or ?

27. Estimate.

a) 71 ÷ 8 b) 247 ÷ 9 c) 312 ÷ 11 d) 619 ÷ 12 e) 741 ÷ 11

28. Divide.

a) $6\overline{)117}$ b) $7\overline{)235}$ c) $8\overline{)242}$ d) $9\overline{)876}$ e) $4\overline{)953}$
f) $3\overline{)187}$ g) $5\overline{)957}$ h) $6\overline{)875}$ i) $7\overline{)852}$ j) $9\overline{)928}$

29. Solve.

a) $n = 400 \div 100$ b) $f = 7000 \div 100$ c) $q = 550 \div 10$
d) $m = 940 \div 10$ e) $p = 1000 \div 100$

30. Solve.

a) $p = 136 \div 8$ b) $q = 217 \div 7$ c) $w = 342 \div 9$ d) $v = 684 \div 6$
e) $y = 980 \div 5$ f) $n = 336 \div 3$ g) $m = 988 \div 4$ h) $k = 1590 \div 6$
i) $r = 2552 \div 8$ j) $f = 3663 \div 9$

Multiplication / Two 2-Digit Factors

31. Complete.

a) $3 \times 5 = ?$ b) $5 \times 7 = ?$ c) $4 \times 6 = ?$ d) $6 \times 7 = ?$

$30 \times 50 = ?$ $50 \times 70 = ?$ $40 \times 60 = ?$ $60 \times 70 = ?$

32. Find the products.

a) 30×20 b) 40×50 c) 30×60 d) 50×60

e) 60×70 f) 70×90 g) 90×90

33. Write two 2-digit factors for each product.

a) 800 b) 900 c) 1500 d) 1800 e) 2400 f) 3000 g) 4200

34. Complete.

a) $$\begin{aligned} 26 \times 40 &= 26 \times 10 \times 4 \\ &= 260 \times 4 \\ &= ? \end{aligned}$$

b) $$\begin{aligned} 35 \times 50 &= 35 \times 10 \times 5 \\ &= ? \times 5 \\ &= ? \end{aligned}$$

c) $$\begin{aligned} 43 \times 60 &= 43 \times ? \times ? \\ &= ? \times ? \\ &= ? \end{aligned}$$

d) $$\begin{aligned} 51 \times 70 &= 51 \times ? \times ? \\ &= ? \times ? \\ &= ? \end{aligned}$$

e) $$\begin{aligned} 63 \times 80 &= 63 \times ? \times ? \\ &= ? \times ? \\ &= ? \end{aligned}$$

f) $$\begin{aligned} 74 \times 90 &= ? \times ? \times ? \\ &= ? \times ? \\ &= ? \end{aligned}$$

35. Multiply.

a) 28×30 b) 37×20 c) 46×40 d) 53×60 e) 62×80

f) 39×50 g) 48×50 h) 59×70 i) 63×50 j) 85×90

36. Multiply.

a) $\begin{array}{r} 18 \\ \underline{17} \end{array}$ b) $\begin{array}{r} 19 \\ \underline{21} \end{array}$ c) $\begin{array}{r} 24 \\ \underline{18} \end{array}$ d) $\begin{array}{r} 32 \\ \underline{25} \end{array}$ e) $\begin{array}{r} 38 \\ \underline{36} \end{array}$ f) $\begin{array}{r} 43 \\ \underline{27} \end{array}$ g) $\begin{array}{r} 53 \\ \underline{37} \end{array}$ h) $\begin{array}{r} 49 \\ \underline{28} \end{array}$

i) $\begin{array}{r} 52 \\ \underline{19} \end{array}$ j) $\begin{array}{r} 63 \\ \underline{27} \end{array}$ k) $\begin{array}{r} 72 \\ \underline{38} \end{array}$ l) $\begin{array}{r} 78 \\ \underline{43} \end{array}$ m) $\begin{array}{r} 84 \\ \underline{29} \end{array}$ n) $\begin{array}{r} 76 \\ \underline{56} \end{array}$ o) $\begin{array}{r} 88 \\ \underline{75} \end{array}$ p) $\begin{array}{r} 97 \\ \underline{69} \end{array}$

37. Solve.

a) $k = 38 \times 42$ b) $m = 19 \times 56$ c) $n = 21 \times 47$ d) $p = 38 \times 65$

e) $y = 87 \times 29$ f) $q = 73 \times 64$ g) $v = 82 \times 76$ h) $w = 87 \times 78$

i) $a = 93 \times 89$ j) $d = 98 \times 86$

Answers to Further Practice / Unit 3

1. a) 8244 b) 11 475 c) 12 141 d) 15 791 e) 18 122 f) 17 023 g) 1021.5
h) 1429.0 i) 1279.3 j) 1023.4 k) 1103.5 l) 973.7 m) 907.78 n) 1522.82
o) 1593.17 p) 1788.45 q) 1096.16 r) 1365.34

2. a) 5323 b) 3768 c) 2185 d) 4887 e) 3089 f) 2881 g) 493.7
h) 338.9 i) 218.9 j) 427.5 k) 481.6 l) 37.5 m) 292.17 n) 285.06
o) 251.58 p) 116.65 q) 185.67 r) 587.63

4. a) $<$ b) $=$ c) $>$ d) $<$ e) $=$

5. a) $k = \frac{3}{4}$ b) $p = \frac{9}{10}$ c) $m = \frac{5}{5}$ d) $n = \frac{2}{2}$ e) $y = \frac{7}{10}$

6. a) $\frac{2}{5}$ b) $\frac{1}{4}$ c) $\frac{1}{2}$ d) $\frac{1}{10}$ e) $\frac{3}{10}$ f) $\frac{2}{5}$ g) $\frac{2}{10}$

7. a) $k = \frac{2}{4}$ b) $p = \frac{1}{2}$ c) $m = \frac{3}{10}$ d) $n = \frac{3}{5}$ e) $q = \frac{1}{10}$

8. a) 4 cm, 40 mm b) 5 cm, 50 mm c) 3 cm, 30 mm d) 7 cm, 70 mm e) 8 cm, 80 mm

10. a) 110 mm b) 140 mm c) 190 mm d) 250 mm e) 300 mm f) 350 mm

11. a) 3 cm b) 5 cm c) 8 cm d) 10 cm e) 40 cm f) 55 cm

12. a) 200 cm b) 400 cm c) 700 cm d) 900 cm e) 2500 cm f) 10 000 cm

13. a) 3 m b) 6 m c) 8 m d) 10 m e) 12 m f) 15 m

14. a) 8, 80, 800 b) 7, 70, 700 c) 11, 110, 1100 d) 18, 180, 1800

15. a) 900 b) 170 c) 380 d) 1200 e) 4200 f) 6700 g) 9300

16. a) 600 b) 900 c) 1400 d) 2700 e) 90 f) 140 g) 2400 h) 200 i) 2000
j) 3800 k) 7000 l) 1000 m) 9000 n) 10 000

17. a) 300 b) 900 c) 1100 d) 1900 e) 3000 f) 4700 g) 9100

18. a) 7, 7, 7 b) 15, 15, 15 c) 27, 27, 27 d) 83, 83, 83 e) 50, 50, 50

19. a) $p = 4$ b) $q = 3$ c) $n = 74$ d) $m = 90$ e) $y = 10$

20. a) 6 b) 7 c) 9 d) 8 e) 25 f) 80 g) 95

21. a) 3 b) 6 c) 20 d) 31 e) 9 f) 90

22. a) 600 b) 1200 c) 800 d) 1200

23. a) 200 b) 500 c) 3200 d) 4200 e) 5300 f) 6900

24. a) 400, 328 b) 1200, 1089 c) 1600, 1304 d) 660, 654 e) 1680, 1676

f) 2600, 2605 g) 3900, 3906 h) 6080, 6096 i) 5740, 5726 j) 8190, 8199
k) 5340, 5352 l) 9000, 8991

25. a) $k = 1500$ b) $n = 3200$ c) $p = 170$ d) $q = 290$

26. a) 15 b) 28 c) 13 d) 29

27. a) 7 b) 25 c) 31 d) 62 e) 74

28. a) 19R3 b) 33R4 c) 30R2 d) 97R3 e) 238R1 f) 62R1 g) 191R2
h) 145R5 i) 121R5 j) 103R1

29. a) $n = 4$ b) $f = 70$ c) $q = 55$ d) $m = 94$ e) $p = 10$

30. a) $p = 17$ b) $q = 31$ c) $w = 38$ d) $v = 114$ e) $y = 196$ f) $n = 112$
g) $m = 247$ h) $k = 265$ i) $r = 319$ j) $f = 407$

31. a) 15, 1500 b) 35, 3500 c) 24,2400 d) 42,4200

32. a) 600 b) 2000 c) 1800 d) 3000 e) 4200 f) 6300 g) 8100

33. Possible factors: a) 40 × 20 b) 30 × 30 c) 50 × 30 d) 60 × 30 e) 60 × 40
f) 60 × 50 g) 60 × 70

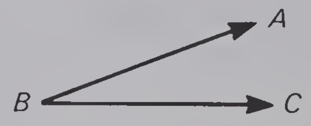
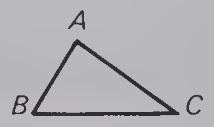
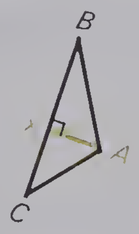
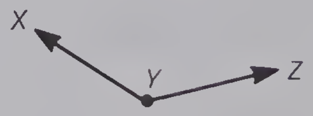
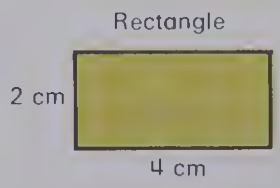
34. a) 1040 b) 1750 c) 2580 d) 3570 e) 5040 f) 6660

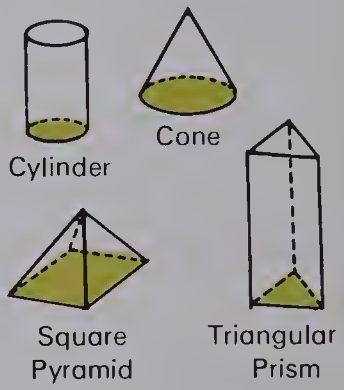
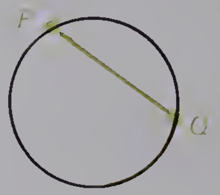
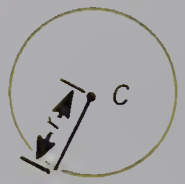
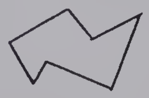
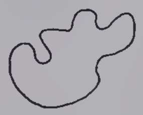
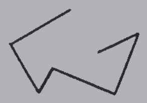
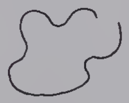
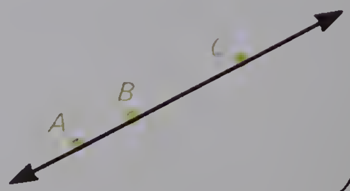
35. a) 840 b) 740 c) 1840 d) 3180 e) 4960 f) 1950 g) 2400 h) 4130
i) 3150 j) 7650

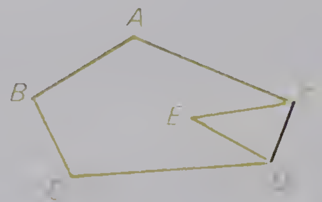
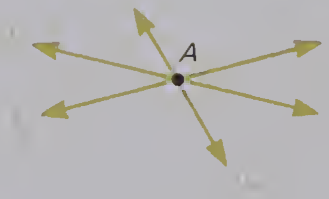
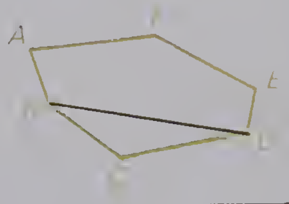
36. a) 306 b) 399 c) 432 d) 800 e) 1368 f) 1161 g) 1961 h) 1372
i) 988 j) 1701 k) 2736 l) 3354 m) 2436 n) 4256 o) 6600 p) 6693

37. a) $k = 1596$ b) $m = 1064$ c) $n = 987$ d) $p = 2470$ e) $y = 2523$
f) $q = 4672$ g) $v = 6232$ h) $w = 6786$ i) $a = 8277$ j) $d = 8428$

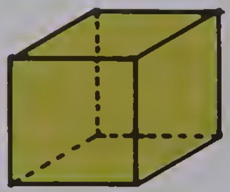
Mathematics Dictionary

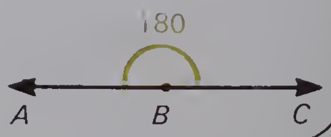
Acute Angle	An angle with measurement less than 90°. $\angle ABC$	
Acute Triangle	A triangle with all 3 angles acute. $\triangle ABC$	
Addends	Numbers which are to be added. 2, 6, 11	2 + 6 + 11
Addition	An operation which combines 2 addends.	
Algorithm	A method for carrying out an operation.	
Altitude (of a Figure)	The line segment from a vertex perpendicular to the side opposite (or its length). (AX for $\triangle ABC$)	
Angle	2 rays with a common end point. $\angle XYZ$	
Anti-Clockwise	See *Counter-Clockwise*.	
Approximately Equal	1.9 × 9 is about 2 × 10 or 20.	
Area	An amount of surface. A number of square units which compares the size of a region to the size of a unit square region.	
Area Expressions	$\text{Area} = (2 \times 4)\ \text{cm}^2$ $= 8\ \text{cm}^2$	

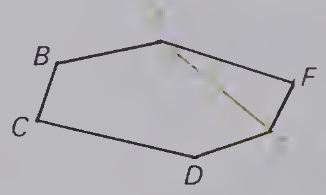
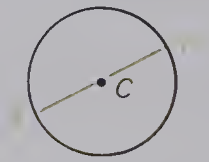
Associative (Grouping) Property	When 3 addends or factors are to be added or multiplied, any 2 may be added or multiplied first. $(3 + 2) + 5 = 3 + (2 + 5)$ $(3 \times 2) \times 5 = 3 \times (2 \times 5)$
Average (Arithmetic Mean)	The quotient of a sum of numbers divided by the number of addends. $M = \frac{2 + 2 + 5 + 12 + 31}{5} = \frac{52}{5} = 10.4$
Base (of a Solid)	*Any* face of the solid. The coloured faces are usually considered bases, but any face may be taken as a base. 
Base (of a Triangle)	*Any* side of a triangle.
Bisect	To separate a geometric figure into 2 congruent parts.
Chord (of a Circle)	A line segment with both end points on a circle. *PQ* 
Circle	The set of points in a plane at a fixed distance (radius, *r*) from a given point (centre, *C*). 
Circumference	The perimeter (length) of a circle.
Clockwise	The direction of rotation of the hands of a clock.
Closed Figure (Curve)	 and  are closed figures.  and  are not closed figures.
Collinear (Points)	3 or more points on the same straight line. *A, B, C* 

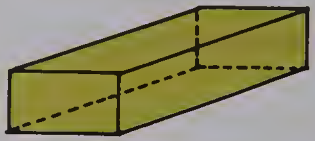
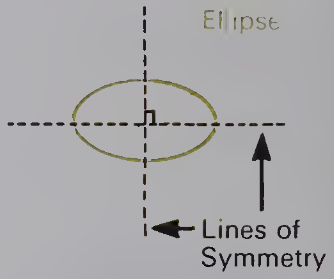
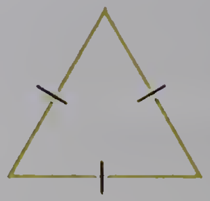
Common Factor	$6 = 3 \times 2$ $15 = 5 \times 3$ 3 is a common factor of 6 and 15. See *Greatest Common Factor.*	
Common Multiple	$12 = 6 \times 2$ $12 = 4 \times 3$ 12 is a common multiple of 6 and 4 (also of 2 and 3). See *Least Common Multiple.*	
Commutative (Order) Property	2 numbers may be added or multiplied in either order. $2 + 3 = 3 + 2$ $2 \times 3 = 3 \times 2$	
Compass	An instrument used to indicate the direction of the North magnetic pole.	
Compasses (Pair of)	An instrument used in the drawing of a circle.	
Composite Number	A whole number which has more than 2 factors.	
Concave Polygon	*ABCDEF* is a concave polygon. At least 1 diagonal (*FD*) lies outside the polygon.	
Concurrent Lines	3 or more lines (l_1, l_2, l_3) with a common point (*A*).	
Congruent Figures	Geometric figures of the same size and shape.	
Consecutive	Next in order, as in **consecutive even whole numbers.**	6, 8, 10, 12
Convex Polygon	*ABCDEF* is a convex polygon. Every diagonal (*BD*, for example) lies within the polygon.	

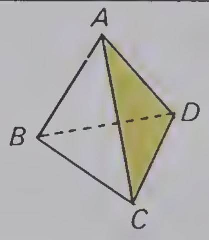
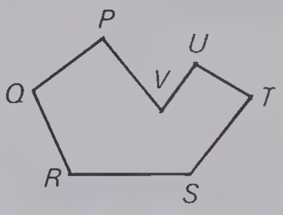
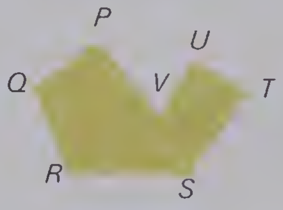
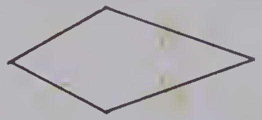
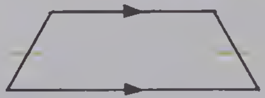
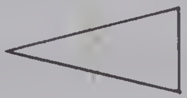
Correspondence (One-to-One)	Each of the members in 2 sets is matched with exactly 1 member in the other set. $\{a, b, c, d, e\}$ $\updownarrow \ \updownarrow \ \updownarrow \ \updownarrow \ \updownarrow$ $\{1, 2, 3, 4, 5\}$
Counter-Clockwise	The direction of rotation opposite to the hands of a clock.
Counting	Matching objects in a set with a subset of the natural numbers 1, 2, 3, 4, ...
Counting Numbers	Often called *natural numbers*. $N = \{1, 2, 3, 4, \ldots\}$ is the set of natural numbers.
Cube	A regular solid with 6 faces. Each face is a square.
Decagon	A polygon with 10 sides.
Decimal	A numeral in decimal notation.
Decimal Numeration System	A place-value system based on powers of 10 (base 10) which represents numbers by using the 10 symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 as digits.
Decimal Place	The power of 10 associated with each position in a decimal numeral. 172.03 1 is in the hundreds place 7 is in the tens place 2 is in the units (ones) place 0 is in the tenths place 3 is in the hundredths place
Decimal Point	The dot in a decimal numeral between the units and tenths places.
Degree	A unit of angle measurement. The measurement of straight angle $\angle ABC$ is 180°.

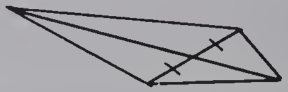
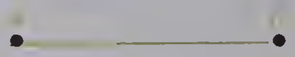
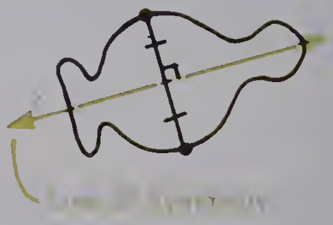
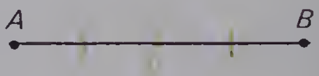


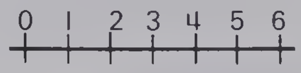
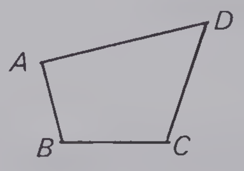
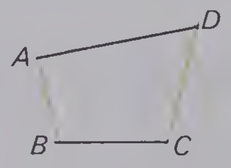


Denominator	10 is the denominator of the fraction $\frac{3}{10}$.	
Diagonal (of a Polygon)	A line segment whose end points are 2 vertices which are not consecutive. *AE* is a diagonal of polygon *ABCDEF*.	
Diameter	*XCY* is a diameter of the circle. The line segment passes through the centre of the circle.	
Difference	The result of subtracting one number from another.	
Digits	The individual symbols used in a numeration system. The digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 for our base 10 system.	
Dimensions	For a plane (2-dimensional) figure—length and width. For a solid (3-dimensional) figure—length, width, and height.	
Distance (Between 2 Points in a Plane)	The length of the line segment joining the 2 points.	
Distributive Property (of Multiplication Over Addition)	$3 \times (2 + 5) = 3 \times 2 + 3 \times 5$	
Dividend	3 ← Quotient Divisor → 6)23 ← **Dividend** $23 = 6 \times 3 + 5$ 18 5 ← Remainder	
Divisible	6)30 with quotient 5 $30 = 6 \times 5$ 30 is divisible by 6	
Division	The undoing operation with respect to multiplication. *Multiplication* (doing) $3 \times 2 = 6$ *Division* (undoing) $6 \div 2 = 3$	

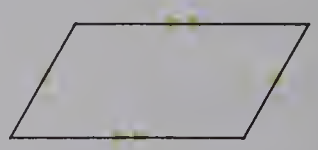
Divisor	See *Dividend*.	
Dodecagon	A polygon with 12 sides.	
Edge (of a Solid)	The black line segments are **edges** of the solid.	
Element (of a Set)	A member of a set.	
Ellipse	A closed plane figure like a circle stretched both ways along a diameter. An ellipse has only 2 lines of symmetry.	
Elliptical	In the shape of an ellipse.	
Empty Set	The set with no elements, { }.	
Equality	The relation between 2 symbols representing the same idea. $8 = 6 + 2$	
Equation	A statement expressing equality. $3 + 5 = 8$ $q + 2 = 6$	
Equilateral Triangle	A triangle with all sides of equal length.	
Equivalent Fractions	Fractions which represent the same number. $\frac{1}{2}, \frac{2}{4}, \frac{5}{10}, \frac{50}{100}, \ldots$	
Estimate	A calculation usually made by rounding off numbers to a multiple of a power of 10. 9×31 is about 10×30 or 300	
Even Number	An even number has 2 as a factor. {0, 2, 4, 6, . . .} is the set of even whole numbers.	

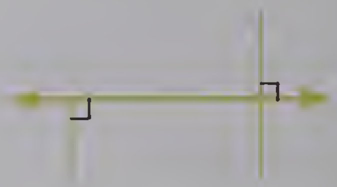
Expanded Notation	$3124 = 3(1000) + 1(100) + 2(10) + 4$	
Face of a 3-D Figure	Triangular region *ADC* is one face of *ABCD*.	
Factor (of a Number)	$36 = 36 \times 1$ 36, 1 are factors of 36 $36 = 18 \times 2$ 18, 2 are factors of 36 $36 = 12 \times 3$ 12, 3 are factors of 36 $36 = 9 \times 4$ 9, 4 are factors of 36 $36 = 6 \times 3 \times 2$ 6, 3, 2 are factors of 36	
Geometry	A study of shapes.	
Graph	An illustration of information.	
Greater Than	7 is greater than 3 (that is, $7 > 3$).	
Greatest Common Factor	$36 = 2 \times 2 \times 3 \times 3$ $24 = 2 \times 2 \times 2 \times 3$ The greatest common factor (GCF) of 24 and 36 is $2 \times 2 \times 3$ or 12	
Height (of a Figure)	Altitude of the figure. See *Altitude*.	
Hexagon	A polygon with 6 sides.	
Inequality	A mathematical sentence involving > (is greater than) or < (is less than).	
Interior (of a Plane Figure)	A polygon The interior of the polygon	 
Inverse Operations	Addition and subtraction are inverse (**doing** and **undoing**) operations. Multiplication and division are inverse operations.	
Isosceles Kite	A kite with 2 pairs of adjacent equal sides.	
Isosceles Trapezium	The non-parallel sides are equal in length.	
Isosceles Triangle	2 sides are equal in length.	

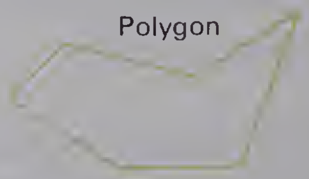
Kite	A quadrilateral with 1 diagonal bisected by the other.	
Least Common Multiple	$8 = 2 \times 2 \times 2$ $12 = 2 \times 2 \times 3$ The least commom multiple (LCM) of 8 and 12 is $2 \times 2 \times 2 \times 3$ or 24	
Length	Describes a line segment.	
Less Than	3 is less than 7 ($3 < 7$).	
Line Segment	Line Segment *AB*	
Line of Symmetry	If the figure is folded along the line *s*, the 2 parts of the figure coincide. The figure is symmetrical with respect to the line.	
Matching	Setting up a one-to-one correspondence from the elements of one set to the elements of a second set. See *Correspondence* (*One-to-One*).	
Mathematics	The logical study of number, patterns, shape, and many related concepts.	
Metre	The basic unit of length in the metric system of measurement.	
Metric System	A decimal system of weights and measures, introduced in France in the 18th century, which is now used throughout most of the world.	
Mid-Point (of a Line Segment)	The point (*P*) which bisects a line segment (*AB*).	
Mixed Numeral	The mixed numeral $3\frac{1}{2}$ means $3 + \frac{1}{2}$	

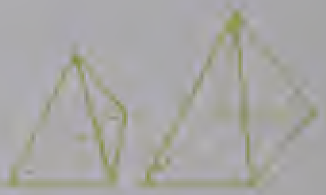
Multiple	$3 \times 5 = 15$ $3 \times 12 = 36$ 15 and 36 are both multiples of 3.	
Multiplication	An operation which combines 2 factors.	
***n*-gon**	A polygon with *n* sides.	
Nonagon	A polygon with 9 sides.	
Number Line	An illustration of a set of numbers.	 Whole Number Line
Numeral	A symbol which represents a number.	
Numerator	2 is the numerator of the fraction $\frac{2}{5}$.	
Obtuse Angle	$\angle ABC$ has measurement between 90° and 180°.	
Obtuse Triangle	$\triangle ABC$ has 1 interior obtuse angle ($\angle ABC$).	
Octagon	A polygon with 8 sides.	
Odd Number	An odd number does not have 2 as a factor. {1, 3, 5, 7, . . .} is the set of odd whole numbers.	
One-to-One Correspondence (Matching)	See *Correspondence* (*One-to-One*).	
Opposite Angles (of a Quadrilateral)	In quadrilateral *ABCD*, $\angle A$ and $\angle C$ are opposite angles, $\angle B$ and $\angle D$ are opposite angles.	
Opposite Sides (of a Quadrilateral)	Sides *AB* and *CD* have no vertex in common. They are opposite.	
Orbit	The path followed by a space body or a man-made space vehicle. The planet Earth has an **elliptical orbit** around the Sun.	

Ordered Pair	A pair of numbers in a specific order. The ordered pair (1, 2) has the opposite order to (2, 1).
Parallel Lines	Lines in the same plane with no points in common.
Parallelogram	A quadrilateral with both pairs of opposite sides parallel.
Pentagon	A polygon with 5 sides.
Perfect Square	The square of a whole number. See *Square* (*of a Number*).
Perimeter	The length of the boundary of a region.
Perpendicular Lines	Lines or line segments which determine a right angle.
Place Value	In 235, 2 means 2 × 100. In 325, 2 means 2 × 10.
Plane Figure	A 2-dimensional figure in a plane.
Polygon	Closed plane figure : each side is a straight line segment.
Prime Number	A whole number which has exactly 2 factors.
Product	The result of multiplication.
Pyramid	A 3-dimensional figure.
Quadrilateral	A polygon with 4 sides.

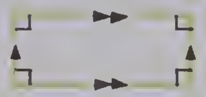
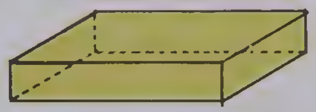
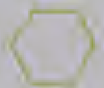
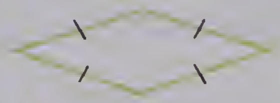
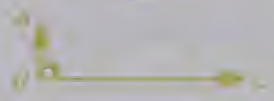
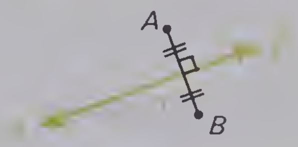
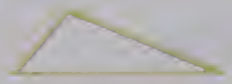
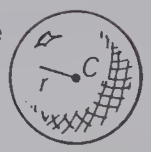
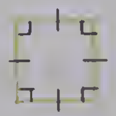


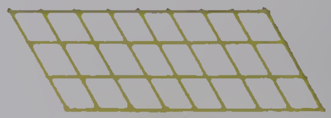
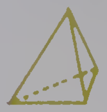
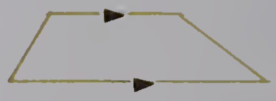
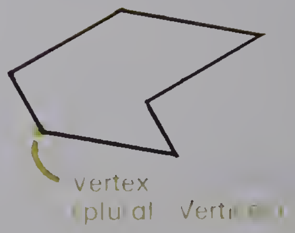





Triangular Pyramid

Square Pyramid

Quotient	4 is called the quotient of $12 \div 3$. See *Dividend*.	$12 \div 3 = 4$
Radius	See *Circle*.	
Rectangle	A parallelogram with angles which are right angles.	
Rectangular Solid	A rectangular prism.	
Regular Polygon	A polygon with all sides equal and all angles equal.	 Regular Hexagon
Remainder	See *Dividend*.	
Rhombus	A quadrilateral with all sides of equal length.	
Right Angle	An angle ($\angle ABC$) with measurement 90°.	
Right Bisector (of a Line Segment)	The line XYZ such that $AY = YB$ and $\angle AYZ = 90°$.	
Scalene Triangle	A triangle with no 2 sides equal.	
Set	A collection of things.	
Shape	A figure and its interior.	
Solid	A 3-dimensional figure (*not* including its interior points).	
Sphere	The set of all points in space at a fixed distance (*radius, r* units) from a given point (*centre, C*).	Sphere 
Square	A rhombus with interior angles right angles.	

Square (of a Number)	The product of 2 equal factors. See *Perfect Square.*	$3 \times 3 = 3^2$ (read 3 squared)
Subtraction	The inverse (undoing) operation with respect to addition. *Addition* (doing) $3 + 5 = 8$ *Subtraction* (undoing) $8 - 5 = 3$	
Successive	See *Consecutive.*	
Sum	The result of adding.	
Symmetry (with Respect to a Line)	See *Line of Symmetry.*	
Tessellation	An arrangement of geometric shapes that would cover a plane.	 Tessellation of Parallelograms
Tetrahedron	A triangular pyramid.	
Tiling	See *Tessellation*	
Trapezium (Trapezoid)	A quadrilateral with 1 pair of opposite sides parallel. See *Isosceles Trapezium.*	
Triangle	A polygon with 3 sides.	
Vertex (of a Polygon)	The point of intersection of adjacent sides of a polygon.	
Volume	An amount of space.	
Whole Numbers	$N_0 = \{0, 1, 2, 3, 4, \ldots\}$ is the set of whole numbers.	

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